West Sacramento GRR

Appendix B

Review Documentation

District Quality Control

Documentation

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QUALITY CONTROL CERTIFICATE FOR CIVIL DESIGN PRODUCTS

PROJECT NAME: *West Sacramento GRR* **PROJECT MANAGER:** Bryon Lake

ORGANIZATION: Civil Design Section B

TECHNICAL PRODUCTS: Engineering Appendix supporting final report for the West Sacramento General reevaluation Report.

PREPARER – I have prepared the above the products in accordance with the Quality Management Plan. I have incorporated or resolved all review issues in accordance with the Quality Management Plan. (Describe any exceptions and why resolution didn't happen).

Preparer: _____ Date: 09/09/2015

Benson Liang, Civil Engineer, PE

REVIEWERS – I have reviewed the product noted above and find it to be in accordance with the Quality Management Plan meeting project requirements, standards of the profession and Corps of Engineers policies and standards. All comments have been back-checked and closed out to my satisfaction.

QC Reviewer: _____ Date: 09/09/2015

Markus Boedtker, Civil Engineer, PE

RESOURCE PROVIDERS– I have reviewed and resolved all critical and technical issues. I agree that all project requirements and standards of the profession and Corps of Engineers policies and standards have been met.

Section Chief: _____ Date: 09/09/2015

Richard A Torbik, PE
Chief, Civil Design Section B

West Sacramento GRR-Engineering Appendix
DQC review
Comment Submitted by: Markus Boedtker
Evaluated by: Benson Liang
Date: 8/7/2015

Coordinating Discipline(s): Civil,

My comments are listed below:

1. Table of Contents: Correct spelling of "REPORT" for Attachment A.

   The spelling was corrected to “REPORT”.

2. Page 5, Paragraph 2.4.1: In the last sentence, it appears part of the sentence is missing, or the first letter should be capitalized.

   The sentence was revised by removing the “.” after embankment.

3. Page 12, Paragraph 2.7.2: In the fourth line on this page, change "they" to "the".
   The sentence was revised as you suggested.

4. Page 20, Paragraph 3.3, South Cross Levee: In the first paragraph, add "feet" after "2" in the third sentence. Also, in the second paragraph, add "from" between "feet" and "each" in the second sentence.

   The sentences were revised as you suggested.

5. Figures 1, 2, 4, and 24: These figures are missing.
   These figures were added to the engineering appendix.

6. Figure 5: This figure is missing fill in the center of the raised levee. Adjust the section to include this compacted fill.
   The figure was added arrow to show fill.

7. Figure 8: The reconstructed levee should be shifted waterward to be flush with the existing waterside slope. This will lessen the possibility of erosion at the point of excavation, and require less fill on the landside slope flattening.

   The Figure 8 was revised as suggested.

8. Figure 10. The adjacent raised levee should be shifted waterward to be flush with the existing waterside slope. This will lessen the amount of fill required for constructing the adjacent levee, and reduce the required real estate. The sand and drain rock layer also needs to extend out of the stability berm at the toe.
   The Figure 10 was revised as suggested.

9. Figures 16 through 23: These figures identify Type 1A or Type 1, 2, or 3 fill. Unless you have descriptions of these type of soils, they should be identified as levee fill, or impermeable fill, or clay, etc.

   Attachment G defines the types of fill materials (see Attachment G), a note was added to those figures.

10. Figures 19, 20, and 22: These figures reference Sheets C-200 through C-207 which are not included.

Those figures were created by local sponsor. Those reference sheets will be available upon request.

Liang, Benson Y SPK

From: Boedtker, Markus S SPK
Sent: Monday, August 10, 2015 7:52 AM
To: Liang, Benson Y SPK
Cc: Torbik, Richard A SPK
Subject: RE: Engineering Appendix- West Sac GRR (DQC) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Benson-

All of my comments have been closed out.

Thanks,
Mark Boedtker
Civil Engineering Section A
Corps of Engineers
(916) 557-6637

-----Original Message-----
From: Liang, Benson Y SPK
Sent: Friday, August 07, 2015 6:19 PM
To: Boedtker, Markus S SPK
Cc: Torbik, Richard A SPK
Subject: RE: Engineering Appendix- West Sac GRR (DQC) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Mark,
Attached file was my responses to your comments. The Engineering appendix folder is link below. Please close all those comments if it is possible. I will be out of office for a training next week. if you need additional information to close those comments, please contact Rick or contact me after 8/19. Thank you for all those valuable comments.

\\amethyst\civcad\WestSacramento\WestSacramentoGRR\CADD\Civil\Engineering_Appendix\Engineering_Appendix

-----Original Message-----
From: Boedtker, Markus S SPK
Sent: Thursday, August 06, 2015 4:26 PM
To: Liang, Benson Y SPK
Cc: Torbik, Richard A SPK
Subject: RE: Engineering Appendix- West Sac GRR (DQC) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Benson-

My comments are listed below:

1. Table of Contents: Correct spelling of "REPORT" for Attachment A.
2. Page 5, Paragraph 2.4.1: In the last sentence, it appears part of the sentence is missing, or the first letter should be capitalized.
3. Page 12, Paragraph 2.7.2: In the fourth line on this page, change "they" to "the".
4. Page 20, Paragraph 3.3, South Cross Levee: In the first paragraph, add "feet" after "2" in the third sentence. Also, in the second paragraph, add "from" between "feet" and "each" in the second sentence.
5. Figures 1, 2, 4, and 24: These figures are missing.
6. Figure 5: This figure is missing fill in the center of the raised levee. Adjust the section to include this compacted fill.
7. Figure 8: The reconstructed levee should be shifted waterward to be flush with the existing waterside slope. This will lessen the possibility of erosion at the point of excavation, and require less fill on the landside slope flattening.
8. Figure 10. The adjacent raised levee should be shifted waterward to be flush with the existing waterside slope. This will lessen the amount of fill required for constructing the adjacent levee, and reduce the required real estate. The sand and drain rock layer also needs to extend out of the stability berm at the toe.
9. Figures 16 through 23: These figures identify Type 1A or Type 1, 2, or 3 fill. Unless you have descriptions of these type of soils, they should be identified as levee fill, or impermeable fill, or clay, etc.
10. Figures 19, 20, and 22: These figures reference Sheets C-200 through C-207 which are not included.

Thanks,
Mark Boedtker
Civil Engineering Section A
Corps of Engineers
(916) 557-6637

-----Original Message-----
From: Liang, Benson Y SPK
Sent: Thursday, August 06, 2015 12:18 PM
To: Boedtker, Markus S SPK
Cc: Torbik, Richard A SPK
Subject: Engineering Appendix- West Sac GRR (DQC) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Mark,
Please click the link below to review the engineering appendix for the west Sacramento GRR.
Thanks,
Benson

\\AMETHYST\civcad\WestSacramento\WestSacramentoGRR\CADD\Civil\Engineering_Appendix

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

QUALITY CONTROL CERTIFICATE FOR COST ENGINEERING PRODUCTS

Project Name: West Sacramento GRR
Project Manager: Bryon Lake

Technical Products: GRR documents
Actual Completion Date: 9/10/2015

PREPARER – I have prepared the above the products in accordance with Quality Management Plan.

Preparer: VRCHOTICKY.ROBERT.DEAN.JR.1231223440 Digitally signed by VRCHOTICKY.ROBERT.DEAN.JR.1231223440 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=VRCHOTICKY.ROBERT.DEAN.JR.1231223440 Date: 2015.09.10 08:57:50 -07'00' date:

REVIEWERS – I have reviewed the product noted above and find it to be in accordance with the Quality Management Plan meeting project requirements, standards of the profession and Corps of Engineers policies and standards.

Lead QC Reviewer: REYNOLDS.JOE.LEROY.1383621085 Digitally signed by REYNOLDS.JOE.LEROY.1383621085 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=REYNOLDS.JOE.LEROY.1383621085 Date: 2015.09.10 08:53:46 -07'00' date:

Preparer – I have incorporated or resolved all review issues in accordance with the Quality Management Plan.

Preparer: VRCHOTICKY.ROBERT.DEAN.JR.1231223440 Digitally signed by VRCHOTICKY.ROBERT.DEAN.JR.1231223440 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=VRCHOTICKY.ROBERT.DEAN.JR.1231223440 Date: 2015.09.10 08:58:35 -07'00' date:

Resource Providers – I have reviewed and resolved all critical and technical issues. I agree that all project requirements and standards of the profession and Corps of Engineers policies and standards have been met.

Section Chief: SESSIONS.CAMERON.LOUIS.1393765972 Digitally signed by SESSIONS.CAMERON.LOUIS.1393765972 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=SESSIONS.CAMERON.LOUIS.1393765972 Date: 2015.09.10 09:02:09 -07'00' date:

Branch Chief: SALYERS.ELIZABETH.A.1072738370 Digitally signed by SALYERS.ELIZABETH.A.1072738370 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=SALYERS.ELIZABETH.A.1072738370 Date: 2015.09.10 09:57:09 -07'00' date:

QUALITY CONTROL CERTIFICATE

Environmental Analysis Section, Planning Division

PROJECT NAME: West Sacramento Flood Risk Management Project GRR
PRODUCT: Final Environmental Impact Statement/Environmental Impact Report
ACTUAL COMPLETION DATE:

PROJECT MANAGER: Bryan Lake

The final environmental impact statement noted below describes in a clear and concise manner the major assumptions, methods, data, and analytical tools used in the analysis, and summarizes the results of the analysis using table and text formats. This District Quality Control (DQC) effort has verified that the environmental effects analysis is compliant with clearly established U.S. Army Corps of Engineers policies, principles and procedures; that the assumptions, methods, data and analytical tools used are appropriate for purposes of an environmental effects analysis; that the level and scope of the analysis are appropriate for purposes of an environmental effects analysis; and that the results are reasonable and consistent within the context of an environmental effects analysis.

Specific product reviewed: This DQC review focused on the revisions made to the CWRB read-ahead final EIS/EIR resulting from comments received by SPD and OWPR reviewers and from public comments received on the draft EIS/EIR.

ENVIRONMENTAL LEAD
I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved all issues identified during DQC review.

Environmental Lead: Sarah Ross-Arouzzet — Title: Environmental Manager

Print Name	Signature	Date
	Sarah Ross Arouzzet	9/11/15

REVIEWER
I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer: Dan Artho — Title: Senior Environmental Manager

Print Name	Signature	Date
	Dan Artho	9/11/15

RESOURCE PROVIDER
I have reviewed the quality control process and ensured that comments have been adequately addressed, documented, and resolved.

Resource Provider: Josh Garcia — Title: Chief, Environmental Analysis Section

Print Name	Signature	Date
		11 SEP 2015

Final West Sac EIS-EIR 8-7-15_DQC_dfa_17aug2015-backcheck.docx

Main document changes and comments

Page 9: Comment [DFA4]	L2PDRDFA	8/18/2015 10:49:00 AM

Is this restoration for mitigation or is it restoration as a project purpose?

The area will be used for mitigation and habitat creation- I've reworded the sentence to better reflect this. Restoration is not one of our project purposes.

DFA BACKCHECK: Concur. Comment Closed.

Page 10: Deleted	L2PDRDFA	8/10/2015 2:41:00 PM

be

Page 12: Comment [DFA6]	L2PDRDFA	8/18/2015 10:50:00 AM

Per the response to EPA comment, a more explicit discussion of how the preferred altnerative was determined to be the LEDPA needs to be included in the FEIS.

Added language here, but also added tables to show acreage impacts based on alternative in Section 3.6-vegetation and wildlife.

DFA BACKCHECK: Concur. Comment Closed.

Page ii: Deleted	L2PDRDFA	9/4/2015 3:25:00 PM

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Page vii: Deleted	L2PDRDFA	9/4/2015 3:25:00 PM

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Page 1: Comment [DFA7]	L2PDRDFA	8/18/2015 10:52:00 AM

The GRR did evaluate Federal interest in addressing levee height concerns, even though it ultimately wasn't justified. Suggest leaving the original text here.

Concur

DFA BACKCHECK: Comment closed.

Page 2: Comment [DFA8]	L2PDRDFA	8/18/2015 10:53:00 AM

What is consistent, the study area? Suggest this statement may be more appropriate in another location that discusses consistency with existing land use plans.

Concur- was trying to say that the Alternative was consistent with the delta plan. Will move to land use and discuss ther

DFA BACKCHECK: Comment closed.

Page 7: Inserted	L2PDRDFA	8/10/2015 3:18:00 PM

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Page 7: Deleted	L2PDRDFA	8/10/2015 3:20:00 PM

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Page 7: Inserted	L2PDRDFA	8/10/2015 3:20:00 PM

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Page 9: Comment [DFA9]	L2PDRDFA	8/18/2015 10:53:00 AM

I think the GRR did address levee height concerns by finding that increasing levee heights for the project were not justified. Suggest leaving the text here as is rather than deleting the identification of height concerns.

Concur- left in height

DFA BACKCHECK: Comment Closed.

Page 11: Deleted	L2PDRDFA	8/13/2015 6:32:00 PM

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Page 11: Inserted	L2PDRDFA	8/13/2015 6:29:00 PM

release

Page 11: Comment [DFA10]	L2PDRDFA	8/18/2015 10:56:00 AM

Is this a 1/200 event on the American River concurrent with a 1/200 event on the Sac River? You should clarify what hydrologic assumptions were used for this.

After talking to Jesse about it, I've taken the 1/200 out and added that additional information can be found in the H&H appendices. The assumptions were based on the comprehensive study and the Natomas PAC, but I don't want to add to many specifics here.

DFA BACKCHECK: Comment closed.

Page 12: Comment [DFA11]	L2PDRDFA	8/18/2015 10:56:00 AM

Is this a project cost of the proposed project or cost that should be assigned to existing O&M? Or is this supposed to be a betterment that will be 100% funded by the sponsor?

This is a project cost since the existing port levees are navigation levees and are maintened by the Corps already. The south cross levee is not in the Federal system and needs to be brought up to Federal standards so it is also a project cost.

DFA BACKCHECK: Comment closed.

Page 12: Comment [DFA12]	**L2PDRDFA**	**8/18/2015 10:57:00 AM**

State standard

Moved sentence to paragraph above so it's not confused with the state information.

DFA BACKCHECK: Comment closed.

Page 14: Inserted	**L2PDRDFA**	**8/10/2015 4:22:00 PM**

The finalized document, and all comments received in the final review, will also be used to prepare the Record of Decision (ROD) for the NEPA lead agency

Page 14: Inserted	**L2PDRDFA**	**8/10/2015 4:24:00 PM**

. In the case of the West Sacramento Project the ROD would be signed by the Assistant Secretary of the Army for Civil Works

Page 14: Inserted	**L2PDRDFA**	**8/10/2015 4:26:00 PM**

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Page 14: Comment [DFA13]	**L2PDRDFA**	**8/18/2015 10:58:00 AM**

Not sure if you want to add anything for CEQA.

Added CEQA information

DFA BACKCHECK: Comment closed.

Page 23: Comment [DFA14]	**L2PDRDFA**	**8/18/2015 10:59:00 AM**

I don't think overtopping is a measure or alternative. Suggest simply calling the measureRaising Levees instead.

Changed to raising levees

DFA BACKCHECK: Comment closed.

Page 23: Comment [DFA15]	**L2PDRDFA**	**8/18/2015 11:00:00 AM**

I don't think you have to mention this if all of the areas that had levee raises identified also required geotech fixes. If that is the case, I would suggest that you can delete this part of the sentence.

Concur, deleted sentence

DFA BACKCHECK: Comment closed.

Page 23: Deleted	**L2PDRDFA**	**8/13/2015 8:04:00 PM**

levee raises to meet

Page 23: Inserted	**L2PDRDFA**	**8/13/2015 8:04:00 PM**

reestablish

Page 23: Inserted	L2PDRDFA	8/13/2015 8:04:00 PM

levee

Page 23: Comment [DFA16]	L2PDRDFA	8/18/2015 11:00:00 AM

Suggest this wording

Concur

DFA BACKCHECK: Comment closed.

Page 32: Comment [DFA17]	L2PDRDFA	9/4/2015 1:51:00 PM

This should be a measure carried forward for further consideration. Suggest you delete this paragraph and make sure this is discussed in the Measures Proposed for Alternatives section.

Moved this paragraph here and reworded slight.y.

DFA BACKCHECK: Comment closed.

Page 33: Inserted	L2PDRDFA	8/11/2015 9:48:00 PM

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Page 33: Comment [DFA18]	L2PDRDFA	9/4/2015 1:52:00 PM

Why shouldn't it be the responsibility of the DWSC O&M responsible parties to maintain the authorized height from the original project? Why is this additional cost born by the current GRR?

These levees are navigation levees and are maintained by the Corps. They need to be improved to complete the protection for the city.

DFA BACKCHECK: Comment closed.

Page 35: Deleted	L2PDRDFA	8/11/2015 10:05:00 PM

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Page 35: Inserted	L2PDRDFA	8/11/2015 10:06:00 PM

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Page 36: Formatted	L2PMCAEB

Font: Bold

Page 43: Comment [DFA19]	L2PDRDFA	9/4/2015 1:53:00 PM

Wouldn't the North Port, South Port, and cross levee repairs address overtopping? Suggest leaving this in the general identification of concerns.

Concur

DFA BACKCHECK: Comment closed.

Page 43: Comment [DFA20]	L2PDRDFA	9/4/2015 1:53:00 PM

Suggest keeping this category as Overtopping Measures

Concur

DFA BACKCHECK: Comment Closed.

Page 45: Comment [DFA21]	L2PDRDFA	9/4/2015 1:54:00 PM

Recommend not deleting since work on north port and south port levees are still included in the alternative to address overtopping.

Concur

DFA BACKCHECK: Comment Closed.

Page 48: Comment [DFA22]	L2PDRDFA	9/4/2015 3:22:00 PM

No longer a measure?

The south cross levee does still need to be raised to be consistent with the system standard.

DFA BACKCHECK Comment closed.

Page 49: Comment [DFA23]	L2PDRDFA	8/13/2015 8:20:00 PM

Delete

Page 52: Comment [DFA24]	L2PDRDFA	9/4/2015 1:55:00 PM

Shouldn't this be deleted?

Concur

DFA BACKCHECK: Comment closed.

Page 52: Comment [DFA25]	L2PDRDFA	9/4/2015 1:56:00 PM

Thought there were no longer any height improvements? Or does this consideration only apply to Alternative 5?

Reworded the improvement, there are height improvements on the port north for every alternative, but for Alt 3 they are taken care of with the closure structure.

DFA BACKCHECK: Comment closed.

Page 53: Comment [DFA26]	L2PDRDFA	9/4/2015 1:56:00 PM

No longer applies to Alt 3?

It still applies, reworded the measure to be consistent with Alt 1

DFA BACKCHECK: Comment closed.

Page 57: Comment [DFA27]	L2PDRDFA	9/4/2015 1:57:00 PM

No longer considered for Alt 3?

Deleted

DFA BACKCHECK: Comment closed.

Page 57: Comment [DFA28]	L2PDRDFA	9/4/2015 1:58:00 PM

No longer considered for Alt 3?

Deleted

DFA BACKCHECK: Comment closed.

Page 58: Comment [DFA29]	L2PDRDFA	9/4/2015 1:58:00 PM

Does this need to be updated?

Updated the table

DFA BACKCHECK: Comment closed.

Page 59: Comment [DFA30]	L2PDRDFA	9/4/2015 1:59:00 PM

Delete or change to reestablish authorized levee height? Be consistent with what was described in Section 2.1.3.

DFA BACKCHECK: Comment closed.

Page 60: Comment [DFA31]	L2PDRDFA	9/4/2015 2:00:00 PM

Update column to reflect current levee height discussion.

Updated

DFA BACKCHECK: Comment closed.

Page 61: Comment [DFA32]	L2PDRDFA	9/4/2015 2:00:00 PM

Update to reflect current levee height discussion

Updated

DFA BACKCHECK: Comment closed.

Page 61: Comment [DFA33]	L2PDRDFA	9/4/2015 2:01:00 PM

Update column to reflect current levee height discussion.

Updated

DFA BACKCHECK: Comment closed.

Page 63: Comment [DFA34]	L2PDRDFA	9/4/2015 2:01:00 PM

Update discussion

Updated

DFA BACKCHECK: Comment closed.

Page 63: Comment [DFA35]	L2PDRDFA	9/4/2015 2:01:00 PM

Update discussion

DFA BACKCHECK: Comment closed.

Page 63: Comment [DFA36]	L2PDRDFA	9/4/2015 2:02:00 PM

Update discussion

DFA BACKCHECK: Comment closed.

Page 63: Comment [DFA37]	L2PDRDFA	9/4/2015 2:03:00 PM

I didn't find the O&M description for alternative 1. Still working on this? Why is a discussion on O&M associated with expanded Sac Weir and Bypass to be included in the West Sac Project?

Updated and added discussion in Section 2.3.3- It was a remnant from ARCF

DFA BACKCHECK: Comment closed.

Page 69: Comment [DFA38]	L2PDRDFA	9/4/2015 2:03:00 PM

Low relative to what? Is there any way that this can be put into perspective?

I added some language that should help to explain. It's based on the flood protection ability after a 200 yr event.

DFA BACKCHECK: Comment closed.

Page 70: Formatted	L2PMCAEB	

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Page 72: Comment [DFA39]	L2PDRDFA	9/4/2015 2:05:00 PM

Include a discussion on consistency with or effects to this land use plan as indicated in the comment responses.

DFA BACKCHECK: Comment closed pending addition of discussion on consistency with Delta Plan.

Page 81: Comment [DFA40]	L2PDRDFA	9/4/2015 2:06:00 PM

What is consistent, the study area? Suggest this statement may be more appropriate in another location that discusses consistency with existing land use plans.

Concur- have added a discussion here

DFA BACKCHECK: Comment closed pending addition of discussion on consistency with Delta Plan.

Page 119: Inserted	L2PDRDFA	8/11/2015 10:38:00 PM

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Page 126: Inserted	L2PDRDFA	8/13/2015 8:47:00 PM

Page 126: Comment [DFA41]	L2PDRDFA	9/4/2015 2:06:00 PM

Shouldn't this paragraph be in the water quality section?
There is a very similar paragraph in water quality. I took out the specific reference to water quality here. I added this paragraph in response to the EPA comments to highlight the benefits of Alt 5 so I'd like to leave it here as well.

DFA BACKCHECK: Comment closed.

Page 127: Comment [DFA42]	L2PDRDFA	9/4/2015 2:07:00 PM

Why was this deleted? Suggest keeping it.
At some point there was a comment that we didn't talk about functions and values elsewhere so we deleted it. I added it back in.

DFA BACKCHECK: Comment closed.

Page 130: Inserted	L2PDRDFA	8/13/2015 8:57:00 PM

project

Page 138: Comment [DFA43]	L2PDRDFA	9/4/2015 2:08:00 PM

O&M not describe in this section.

Updated Section 2.3.3

DFA BACKCHECK: Comment closed.

Page 188: Comment [DFA44]	L2PDRDFA	9/4/2015 2:09:00 PM

Include discussion on BO requirements.

Will incluce

DFA BACKCHECK: Comment closed pending discussion of BO requirements here.

Page 219: Comment [DFA45]	L2PDRDFA	9/4/2015 2:10:00 PM

No alternative 2

Corrected this

DFA BACKCHECK: Comment closed.

Page 413: Inserted	L2PDRDFA	8/13/2015 9:18:00 PM

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Page 413: Inserted	L2PDRDFA	8/13/2015 9:18:00 PM

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Page 413: Deleted	L2PDRDFA	8/13/2015 9:18:00 PM

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Page 420: Comment [DFA46]	L2PDRDFA	9/4/2015 2:11:00 PM

Add a discussion on compliance with the Delta Plan. Is it a State or Federal Law?

Added below

DFA BACKCHECK: Comment closed pending addition of discussion on Delta Plan compliance.

Header and footer changes

Text Box changes

Header and footer text box changes

Footnote changes

Endnote changes

Main document changes and comments

Page 4: Inserted **L2PDRDFA** **8/12/2015 10:46:00 PM**

C

Page 4: Inserted **Sarah Ross** **9/10/2015 4:07:00 PM**

by WSAFCA through their Southport 408 project

Page 4: Comment [DFA1] **L2PDRDFA** **9/11/2015 8:50:00 AM**

Is ecosystem restoration a project purpose?

No, it's just a flood risk reduction project, hopefully the added language clarifies that.

DFA BACKCHECK: Comment closed.

Page 7: Inserted **Sarah Ross** **9/10/2015 4:12:00 PM**

Section 3.6 of

Page 8: Comment [DFA2] **L2PDRDFA** **9/11/2015 8:53:00 AM**

Suggest identifying which sections the language was added to.

Added

DFA BACKCHECK: Comment closed.

Page 8: Inserted **Sarah Ross** **9/10/2015 4:12:00 PM**

The Corps has also updated the mitigation measures in Section 3.6.7 to include wetland delineations in the pre construction engineering and design phase and to avoid and minimize impacts to wetlands where possible .

Page 8: Deleted **Sarah Ross** **9/10/2015 4:12:00 PM**

will

Page 8: Inserted **Sarah Ross** **9/10/2015 4:12:00 PM**

has

Page 8: Inserted **Sarah Ross** **9/10/2015 4:12:00 PM**

d

Page 8: Comment [DFA3] **L2PDRDFA** **9/11/2015 8:54:00 AM**

Suggest you do this as well, if it was developed in-house and can be easily accomplished.

Updated

DFA BACKCHECK: Comment closed.

Page 8: Inserted	Sarah Ross	9/10/2015 4:12:00 PM

The revised 404(b)(1) analysis is provided in Appendix F to the final EIS/EIR.

Page 8: Inserted	Sarah Ross	9/10/2015 4:13:00 PM

has

Page 8: Inserted	Sarah Ross	9/10/2015 4:13:00 PM

Chapter 3, Section 3.6.7 of

Page 8: Inserted	Sarah Ross	9/10/2015 4:13:00 PM

has

Page 8: Inserted	Sarah Ross	9/10/2015 4:14:00 PM

in Section 3.6 of the final EIS/EIR

Page 8: Comment [DFA4]	L2PDRDFA	9/11/2015 8:54:00 AM

Identify sections in EIS/EIR that changes were made.

Added

DFA BACKCHECK: Comment closed.

Page 8: Inserted	Sarah Ross	9/10/2015 4:15:00 PM

Plates for land type and waters of the US including wetlands have been included in the plates.

Page 9: Deleted	Sarah Ross	9/10/2015 4:15:00 PM

page XX

Page 9: Inserted	Sarah Ross	9/10/2015 4:15:00 PM

Chapter 2 and Chapter 3, Sections 3.6, 3,7, and 3.8

Page 9: Comment [DFA5]	L2PDRDFA	9/11/2015 8:55:00 AM

Identify section in EIS where changes can be found.

Added

DFA BACKCHECK: Comment closed.

Page 9: Comment [DFA6]	L2PDRDFA	9/11/2015 8:57:00 AM

Is this a significant additional cost that would affect the justification of the selected plan?

No, the selected plan would still have the least impacts to vegetation along levees because of the setback levee.

DFA BACKCHECK: Comment closed.

Page 9: Comment [DFA7]	L2PDRDFA	9/11/2015 12:22:00 PM

What was this ratio based on? May want to include qualifying language that acknowledges the Corps CE/ICA requirement for deterimining mitigation needs.

Added language

DFA BACKCHECK: Corps policy requires a cost effectiveness/incremental cost analysis be done for any habitat mitigation needs. Isn't one being prepared? Comment Open.

The CE/ICA was conducted for this project and is discussed in Section 3.6 and 3.6.7 of the EIS. The 2:1 mitigation ration did turn out to be a best buy plan.

DFA BACKCHECK(2): Comment closed.

Page 9: Inserted	Sarah Ross	9/10/2015 4:17:00 PM

as discussed in Chapter 3, Section 3.6.7 of the EIS/EIR

Page 9: Inserted	Sarah Ross	9/10/2015 4:17:00 PM

The 2:1 ratio was developed in coordination with USFWS as discussed in Section 3.6 to mitigation for temporal loss of habitat.

Page 10: Inserted	Sarah Ross	9/10/2015 4:19:00 PM

Chapter 2 and Chapter 3, sections 3.6, 3.7, and 3.8

Page 10: Deleted	Sarah Ross	9/10/2015 4:19:00 PM

page XX

Page 10: Inserted	Sarah Ross	9/10/2015 4:19:00 PM

1 in Appendix I

Page 10: Deleted	Sarah Ross	9/10/2015 4:19:00 PM

XX

Page 14: Deleted	Sarah Ross	9/10/2015 4:20:00 PM

will

Page 14: Inserted	Sarah Ross	9/10/2015 4:20:00 PM

has

Page 14: Inserted	Sarah Ross	9/10/2015 4:20:00 PM

d

Page 14: Inserted	Sarah Ross	9/10/2015 4:20:00 PM

in Appendix C, the Cultural Resources Appendix

Page 14: Comment [DFA8]	L2PDRDFA	9/11/2015 9:04:00 AM

Identify what section in the EIS this information would be added.

DFA BACKCHECK: Comment closed.

Page 16: Inserted	Sarah Ross	9/10/2015 4:23:00 PM

in Chapter 4, Section 4.2.13

Page 16: Deleted	Sarah Ross	9/11/2015 12:10:00 PM

.

Page 16: Comment [DFA9]	L2PDRDFA	9/11/2015 12:24:00 PM

Suggest adding a summary of the findings of the additional evaluation. Also, I think PG&E is wanting you to make an assessment of impacts to all affected resources associated with their construction activities to do the relocation. Do we have enough detail in our designs at this point to make an assessment on impacts associated with utility relocations? If not, would this require supplemental environmental analyses when the detail is known? Might want to check with OC.

See responses to OC comments . We don't have enough information to do that kind of analysis right now.

DFA BACKCHECK: Where are the responses to OC comments? In this instance, since there is a lack of detail you should indicate that supplemental environmental analyses would be completed during PED if final designs indicate that need. Comment Open.

Sent responses to OC comments and included additional language about conducting additional analysis in PED.

DFA BACKCHECK(2): Comment closed.

Page 16: Inserted	Sarah Ross	9/11/2015 12:10:00 PM

and if necessary, supplemental environmental analyses would be completed during PED if final designs indicate that need.

Page 17: Comment [DFA10]	L2PDRDFA	9/11/2015 9:05:00 AM

What attached memo?

Attached to email, will include it with these responses.

DFA BACKCHECK: Comment closed.

Page 17: Comment [DFA11]	L2PDRDFA	9/11/2015 9:06:00 AM

What attached memo?

Attached to email

DFA BACKCHECK: Comment closed.

Page 18: Deleted	Sarah Ross	9/11/2015 12:14:00 PM

restoration

Page 18: Inserted	Sarah Ross	9/10/2015 4:32:00 PM

mitigation

Page 18: Deleted	Sarah Ross	9/10/2015 4:33:00 PM

benefits to

Page 18: Inserted	Sarah Ross	9/11/2015 12:14:00 PM

to be implemented in the project area.

Page 18: Deleted	Sarah Ross	9/11/2015 12:14:00 PM

the Sacramento River system.

Page 18: Comment [DFA12]	L2PDRDFA	9/11/2015 12:24:00 PM

ER is not a project purpose. Suggest deleting this statement unless this is a relevant statement for this commenter.

Per OC's request have sent ICF these comments to get some additional input from them.

DFA BACKCHECK: Still not clear as to why this setback feature is needed for FRM. I like the idea of setback levees, but in this case it seems like it is only included in the plan as an ER feature. Therefore, wouldn't it be considered a betterment in a FRM-only project, which would be 100% non-Fed cost? Need stronger justification for inclusion of this setback as a necessary FRM feature, particularly if there is such opposition from the landowner. Comment open.

Removed restoration and changed the sentence.

DFA BACKCHECK(2): Comment closed.

Header and footer changes

Text Box changes

Header and footer text box changes

Footnote changes

Endnote changes

QUALITY CONTROL CERTIFICATE

Environmental Planning Section, Planning Division

PROJECT NAME: West Sacramento Project GRR
PRODUCT: Habitat Mitigation Monitoring and Adaptive Management Plan
ACTUAL COMPLETION DATE:

PROJECT MANAGER: Bryan Lake

The District has completed review of the habitat mitigation monitoring and adaptive management plan for the West Sacramento Project General Reevaluation Report. Certification is hereby given that all quality control activities defined in the Project Review Plan appropriate to the level of risk and complexity inherent in the product have been completed. Documentation of the quality control process is enclosed.

Compliance with clearly established principles and procedures, utilizing clearly justified and valid assumptions, has been verified. This includes assumptions, methods, procedures and materials used in analyses; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the product meets consistency with law and existing Corps policy. All appropriate DQC comments have been incorporated into this project. The undersigned recommends certification of the quality control process for this product.

ENVIRONMENTAL LEAD

I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved all issues identified during DQC review.

Environmental Lead: Sarah Ross-Arrouzet Title: Senior Environmental Manager

Signature Date 12/1/15

REVIEWER

I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer: Dan Artho Title: Senior Environmental Manager

Signature Date 12/1/15

RESOURCE PROVIDER

I have reviewed the quality control process and ensured that comments have been adequately addressed, documented, and resolved.

for Resource Provider: Josh Garcia Title: Chief, Environmental Analysis Section

Zimnasky, Mark T.

Signature Date 1/7/16

DQC BACKCHECK -- Appendix I Mitigation and Monitoring Plan_DFA.docx

Main document changes and comments

Page 4: Comment [DFA1]	L2PDRDFA	11/24/2015 3:37:00 PM

Repeat of statement above. Suggest deleting. Or is this supposed to be on American River?

RESPONSE: Combined the sentences so that the description seems less repetitive.

DFA BACKCHECK: Comment was in reference to the discussion about levee raising on the Sac River in the third sentence of the paragraph. However, this is more of an editorial comment than a content-related comment and the paragraph as it currently stands sufficiently provides the summary of the proposed measure. COMMENT CLOSED.

Page 5: Comment [DFA2]	L2PDRDFA	11/24/2015 3:38:00 PM

Does this apply to Sacramento River as well? Might want to indicate so in the Figure title if that is the case.

RESPONSE: Figure 1 is the American River scenario, while Figure 2 is the Sacramento River scenario. The rivers have been added to the two figures.

BACKCHECK DFA: Perfect. COMMENT CLOSED.

Page 2: Comment [DFA3]	L2PDRDFA	11/30/2015 4:00:00 PM

Are the HSIs for the future without project estimated to be the same as the future with-project? If so, you need to state that. If not, you should show a separate table for the FWOP HSI values for each target year.

Response: The FWOP HIS output is different so we've added in the table that show the values for each target year.

BACKCHECK DFA: Comment Closed.

Page 2: Comment [SRR4]	Sarah Ross	11/22/2015 9:36:00 PM

Add reference to paragraph above

Page 3: Comment [DFA5]	L2PDRDFA	11/30/2015 4:00:00 PM

This table shows the Mayhew Drain HEP results, correct? If that is the case, then you should indicate as such in the Table title. I would also recommend adding a footnote to the table explaining how this information was applied to ARCF mitigation requirements.

Response: Added Mayhew drain project to the title of the table and added a foot not explaining how the information was applied to ARCF.

BACKCHECK DFA: Acceptable. Comment closed.

Page 3: Comment [DFA6]	L2PDRDFA	11/30/2015 4:05:00 PM

Where are the results of the CE/ICA? Recommend showing the standard line and bar graphs that plot the CE plants and the incremental cost comparison between mitigation proposals.

Response: The CE/ICA results can be found at the end of Appendix I.

BACKCHECK DFA: Text needed a reference to where the CE/ICA is located. Reference included. Comment Closed.

Page 3: Comment [DFA7]	L2PDRDFA	11/30/2015 4:05:00 PM

Should this be AAHU's?

Response: Concur

BACKCHECK DFA: Comment Closed.

Page 5: Comment [DFA8]	L2PDRDFA	11/30/2015 4:06:00 PM

Indicate the specific source of these requirements; e.g., BOs, CAR, FWS Mitigation Policy, etc.

RESPONSE: Concur. Revised sentence to refer to the BOs and CAR.

BACKCHECK DFA: Comment Closed.

Page 6: Comment [DFA9]	L2PDRDFA	11/30/2015 4:06:00 PM

Make sure to remove this reference to West Sac GRR in the ARCF MMAMP, and vice-versa for the West Sac plan.

Response. Concur. Will remove all references to the other GRR when we finalize the HMMAMP

BACKCHECK DFA: Comment closed.

Page 6: Comment [DFA10]	L2PDRDFA	11/30/2015 4:07:00 PM

See comment above.

Response. Concur.

BACKCHECK DFA: Comment closed.

Page 7: Comment [DFA11]	L2PDRDFA	11/30/2015 4:08:00 PM

General question: Does onsite mitigation require purchase of land in fee title to guarantee land remains habitat mitigation in perpetuity?

Response. Yes, onsite mitigation must be purchased & protected in perpetuity. It might not be possible for bank protection sites though. For the Parkway, we are leasing the land, so there is an additional fee for land lease. Do you want us to add more info about this into the plan?

BACKCHECK DFA: Not necessary, if identified as such in the EIS. Comment closed.

Page 10: Comment [DFA12]	L2PDRDFA	11/30/2015 4:09:00 PM

Is this supposed to be 50%?

RESPONSE: Yes. The percent sign has been added.

BACKCHECK DFA: Comment closed.

Page 10: Comment [DFA13]	L2PDRDFA	11/30/2015 4:09:00 PM

Is there a specific depth that should be identified, or distance from shoreline?

Response. The specific depth is currently unknown and would be determined through preconstruction monitoring and modeling efforts. As a result, at this time based on current science the full width of the river/channel should be monitored. The table has been revised to reflect this.

BACKCHECK DFA: Comment closed.

Page 14: Comment [DFA14]	L2PDRDFA	11/30/2015 4:13:00 PM

What are these performance standards based off of? Recommend indicating the source that these standards were derived from.

RESPONSE: Added in the note below the table.

Dan, it would be helpful if you can weigh in on whether or not Natomas is a reasonable source for HQ purposes. I'm trying to use the proximity/habitat quality argument on why its valid, but it is not a Corps project, and I'm worried that they would prefer to see something from the Corps as a source. Sutter had very similar, but slightly lower performance standards that we could use as a Corps source – they range from 80% to 60% over time. I would be comfortable with switching to those if you think it is a stronger argument.

BACKCHECK DFA: Suggest keeping these in light of the fact that success criteria from several different projects were considered. Comment closed.

Page 15: Comment [DFA15]	L2PDRDFA	11/30/2015 4:13:00 PM

Where are the reference reaches? How do the success criteria relate to the reference reaches?

Response: I'm not sure that "reference reaches" was an appropriate goal. I think it would be more accurate to say that our long-term goal is to provide replacement habitat similar to the habitat that was impacted by project construction. The goal is compensation, not enhancement. The language has been adjusted to reflect this.

BACKCHECK DFA: Concur. Comment closed.

Page 16: Comment [DFA16]	L2PDRDFA	11/30/2015 4:14:00 PM

What sources, literature, expert opinion, etc., supports these performance standards?

Response. See above response and added footnote

BACKCHECK DFA: Comment closed.

Page 21: Comment [DFA17]	L2PDRDFA	11/30/2015 4:15:00 PM

What is the basis for these standards?

RESPONSE: Added note to table establishing the source of the standards.

BACKCHECK DFA: Comment closed.

Page 24: Comment [DFA18]	L2PDRDFA	12/1/2015 8:59:00 AM

I don't think you have included sufficient justification for development of a physical model for this study as called for by HQ review comments. Perhaps indicating that existing info and model outputs suggested a jeopardy opinion to green sturgeon. Also, why are both an EFM and Physical model necessary?

Response. Added language clarifying that the purpose of this modeling effort is to address the differing resource needs for each listed species and inform design refinements for the projects.

BACKCHECK DFA: Still not clear if this is needed per BiOp requirements. I'll defer to SME's about the need for this, but suggest presenting stronger justification for this extra cost. Comment closed.

Page 25: Comment [DFA19]	L2PDRDFA	12/1/2015 8:54:00 AM

Would it be from SAM or from the EFM Model developed for green sturgeon?

RESPONSE: I think the idea right now is that we don't know what the EFM model will tell us yet, therefore the SAM is still the best available tool, and the performance standards are currently developed from the SAM. With the long term goal to refine them based on the results of the EFM model. I reworded this paragraph slightly to focus on the present standard being from SAM. Also reworded the paragraph associated with the below bullet list to reflect that those could be future performance standards developed from EFM.

BACKCHECK DFA: Comment closed.

Page 26: Comment [DFA20]	L2PDRDFA	12/1/2015 8:54:00 AM

What establishes these as appropriate standards for sturgeon mitigation success? Is there literature, studies, etc., that supports this?

Response. The District fisheries team met with NMFS to coordinate appropriate performance standards based on the current best available science. Their determination was that the current best data is based on the SAM analysis, therefore they selected outputs from the SAM that they felt were likely relevant to sturgeon and that would likely remain relevant even with the future modeling efforts.

BACKCHECK DFA: Comment closed.

Page 30: Comment [DFA21]	L2PDRDFA	12/1/2015 8:47:00 AM

Per WRRDA 2007, you will need to identify the costs of monitoring separate from the costs for adaptive management.

Response. Concur. The section has been revised to present the monitoring costs separate from the adaptive management costs, and a total for the overall plan.

BACKCHECK DFA: Comment closed.

Header and footer changes

Text Box changes

Header and footer text box changes

Footnote changes

Endnote changes

QUALITY CONTROL CERTIFICATE FOR GEOTECHNICAL ENGINEERING PRODUCTS

Project Name: West Sacramento GRR
Project Manager: Glen Reed
Lead Planner: Andrew Muha
Technical Lead: Benson Liang

Preparing Organization Soil Design Section B

Technical Product Name: West Sacramento General Reevaluation Report Geotechnical Appendix

Actual Completion Date: 10/14, modified 9/9/15 per ATR comments.

CERTIFICATION

I have reviewed and resolved all critical and technical issues that arose during ATR after the previous certificate was signed. I agree that all project requirements and standards of the profession and Corps of Engineers policies and standards have been met.

Section Chief: _____ Date: 9/9/15

Signature – Erik W James, PE, PG

Branch Chief: _____ Date: 9/9/15

Signature – April L. Fontaine, PG

West Sacramento Project
DISTRICT QUALITY CONTROL CERTIFICATE
General Reevaluation Report (GRR)

The District Quality Control (DQC) has been completed for the General Reevaluation Report Report (GRR) for the West Sacramento Project specific to the Geotechnical Appendix. The reviewer has thoroughly checked the calculations including assumptions, mandated parameters, references, given values, and formulas. The reviewer has checked for omissions and accuracy of arithmetic; asked questions of the analyst if unsure of any particular element of the calculation; and reviewed the output data of computer calculations for consistency with expected results.

DQC was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the DQC, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in design and analyses of the West Sacramento Project study area, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the design meets the Corps' needs consistent with law and existing US Army Corps of Engineers policy.

Product(s) Description: *Geotechnical Appendix – West Sacramento Project – General Reevaluation Report*

Originated by: *Anthony J. Deus*

Print Name: Anthony J. Deus Sign/Date: 1/8/2014

Reviewed by: *Mary Perlea*

☒ Package of product/calculations have been checked and no outstanding issues identified.

☒ Package of product/calculations have been checked and outstanding issues identified.

☒ Dr. Check's comments, responses, and back-checks have been closed or addressed.

Print Name: Mary Perlea Sign/Date: Mary Perlea 1/8/14

Corrected by: *Anthony J. Deus*

Print Name: Anthony J. Deus Sign/Date: 1/8/2014

Back-checked by: *Mary Perlea*

Print Name: Mary Perlea Sign/Date: Mary Perlea 1/28/2014

Quality Assurance Verification by: *Derek S. Morley*

Print Name: Derek S. Morley Sign/Date:

WEST SACRAMENTO GRR
SPK HYDRAULIC ANALYSIS SECTION
DISTRICT QUALITY CONTROL REVIEW

HYDRAULIC APPENDIX
WEST SACRAMENTO TSP SELECTION

Reviewer: Morgan Marlatt
Hydraulic Engineer, Hydraulic Analysis Section
Review Date: September 23, 2013

The following contains SPK District Quality Control (DQC) performed on the report noted above.

No.	Date	Notes
1.	Comment	Table of Contents – Some of the page numbers are missing/incorrectly linked. Please fix.
	Response	Table of contents was fixed. All sections are referenced correctly.
	Back-check	Thank you, Comment closed.
2.	Comment	Section 1.1 mentions a list of memos follows the Table of Contents, but this list does not appear in the document after the Table of Contents. Please either add the list or remove the reference to the location after the table of contents.
	Response	List was added on page 6
	Back-check	Thank you, Comment closed.
3.	Comment	Plates – The plates listed in this document are not listed in traditional order (1, 2, 3 … etc), the first plate mentioned is Plate 4, suggest renumbering plates so they go in order of the references in the report. Also, some plates (1, 3, 23, 24) were not mentioned in the report.
	Response	Plates were re-numbered to match order discussed in document. All plates are now referenced.
	Back-check	Thank you, Comment closed.
4.	Comment	Section 1.2, 3rd paragraph, 3rd sentence – Tells readers to see Plate 2 for the system layout, but plate 3 has the system layout. Please correct or renumber the plates.
	Response	Plates were re-numbered and references the correct plate.

	Back-check	Thank you, Comment closed.
5.	Comment	Please add page numbers to this document.
	Response	Page numbers were added.
	Back-check	Thank you, Comment closed.
6.	Comment	Section 1.3, last paragraph, last sentence – Please define SACOG or develop an acronyms list.
	Response	SACOG is the Sacramento Area Council of Governments. This was added to the document text.
	Back-check	Thank you, Comment closed.
7.	Comment	Section 1.4, 4th paragraph – Since some of the work has been postponed; do we have a risk register for any potential issues for not doing the work before design phase?
	Response	The assumptions made to reduce the level of detail or postponed analyses until the design phase are captured in the Risk Register.
	Back-check	Can you please provide a copy of the risk register?
	Response	Copy of Risk Register was provided
	Back-check	Thank you, Comment closed.
8.	Comment	Table 1.1, Climate Change – Add a reference to the Sutter Feasibility Study in case your reader is unfamiliar with their methodology. Sea Level Rise – Is there a document to reference?
	Response	Added reference to the Climate Change technical memo that further describes methodology (and has reference to Sutter Feasibility Study). For Sea Level Rise, I referenced the Dynamic Solutions report.
	Back-check	Thank you, Comment closed.
9.	Comment	Section 2.1 – This is a great description of the area, can you add the northern and southern sub-basin labels to the project map and reference the map? And, make sure the terms in bold are the same terms used for labeling on the plate map.
	Response	Northern and southern sub-basin labels were added, names in the plate and document match, and map was referenced in text of

		document.
	Back-check	On plate 3 the label is "Sacramento River South Levee" and in the report it is "Sacramento River West South Levee" – please correct.
	Response	The report text was changed to "Sacramento South Levee" to match the label in plate 3.
	Back-check	Thank you, Comment closed.
10.	Comment	Section 2.1 – second paragraph – suggest adding a footnote to "rivermile" identifying if these are Comp Study River miles or USGS river miles.
	Response	Footnote was added. River miles refer to river miles from the Sacramento Basin HEC-RAS model and UNET Comp Study model.
	Back-check	Thank you, Comment closed.
11.	Comment	Section 2.2, 2nd paragraph – Do you need to mention Sac Bank and the Southport 408 project? The SacBank setback at RM 57.2 is near completion – will it be part of the without project conditions?
	Response	These are not included as the without project condition. The Southport 408 has not been approved and we are analyzing it as alternative 5. A discussion of the SacBank setback has been added. Since there is no hydraulic impact with the SacBank setback, it will not affect the West Sac results.
	Back-check	Thank you, Comment closed.
12.	Comment	Section 3.1, 3rd paragraph – The DWSC is dredged regularly, does the topo in the model account for this, was it done before or after the latest dredging and was there any coordination done with that project?
	Response	This section references the DWSC Technical Memorandum. In this memo it describes topography and bathymetry based on Comp Study, DWSC soundings from 2008 & 2009, and 2006 LiDAR. The bathymetry was updated with data from the soundings (that represents depths with dredging). These sources of data are considered to be best available.
	Back-check	Thank you, Comment closed.
13.	Comment	Section 3.3, last paragraph – Is there somewhere the reader can see the comparison of model results and calibration data?
	Response	All that information is in the Calibration Technical Memo (referenced in paragraph 1 of Section 3.3)
	Back-check	Thank you, Comment closed.

14.	Comment	Section 3.4, 1st paragraph, 3rd sentence – This sentence mentions levee raising, this is the first mention of this in this appendix, this should probably have been mentioned before as it is not clear whether you are referring to levee raises in regards to this project or levee raises from other projects previously discussed in this document.
	Response	Since this section is discussing FWOP, I moved the levee raising discussion to Alternative 1.
	Back-check	Thank you, Comment closed.
15.	Comment	Plate 18 is either mislabeled as the 10-yr WSE or it is the wrong figure, please fix as appropriate.
	Response	Plate 18 was updated with the 200-yr WSEL profile.
	Back-check	Thank you, Comment closed.
16.	Comment	Section 4.1, last 2 paragraphs – Mentions that in Plates 11 – 20, alternatives 1 – 4 are shown, but in Plates 11, 12, 13, 14, 16, 17, 18, and 19, only alternatives 1 and 2 are shown.
	Response	For plates 11-19, Alt 1 & Alt 3 are the same (represented by the same line) and Alt 2 & Alt 4 are the same (also represented by the same line). This is shown and labeled in the key.
	Back-check	Thank you, Comment closed.
17.	Comment	Plates 12 and 17 – There is one line for the top of levee and it is labeled "top of levee left right." Which bank does this represent and where is the line representing the opposite bank?
	Response	The line was to represent the right bank. A line for the left bank was also added.
	Back-check	Thank you, Comment closed.
18.	Comment	Plates 11 – 20 – Please add a summary of the graphs in section 4.1. Also add to the report why you are only showing the 10-yr and 200-yr results when you ran the whole slew of n-yr events.
	Response	Summary of graphics was added. Discussion of why 10-yr and 200-yr are the only results being reported was also added.
	Back-check	Thank you, Comment closed.
19.	Comment	Section 4.2, 2nd paragraph – If your fixes for this alternative are primarily landside fixes, how does that address erosion, and lack of veg compliance? Maybe a figure depicting which areas would be fix in place and which areas would be adjacent levees would help to answer this.
	Response	This section was updated. After checking with Planning and team

		members, all fixes proposed are fix in place (no adjacent levees).
	Back-check	Thank you, Comment closed.
20.	Comment	Table 4-1 – The label for this table should be above the table and the font size should not be smaller than the font size in the table.
	Response	The label was moved to above the table and font size increased.
	Back-check	Thank you, Comment closed.
21.	Comment	Table 4-1 – The column with the "No." heading, I assume that is the reach number? If so, please state that, otherwise remove.
	Response	The "No." column was removed.
	Back-check	Thank you, Comment closed.
22.	Comment	Section 4.3, 1st paragraph, 2nd sentence – Please add a word after "more" to indicate what you are redirecting.
	Response	The word "water" was added after "more"
	Back-check	Thank you, Comment closed.
23.	Comment	Section 4.4 – Please reference Plate 23 for the location of the closure structure. Also Plate 24 for Section 4.5
	Response	Plate 23 and 24 were referenced in Section 4.4 and 4.5, respectively.
	Back-check	Thank you, Comment closed.
24.	Comment	Section 4.3 – What model was used to analyze the widening? Can you state it and add some more details about how much water you expect to be diverted into the bypass rather than continuing down the Sacramento River?
	Response	The same HEC-RAS model used to analyze Alternative 1 was used (with adjustments to the Sacramento Weir width). Also added sentence "With this alternative the stages at the downstream portion of West Sacramento (near the Pocket) would be reduced by a foot (compared to the FWOP condition)." Since this alternative has been screened out, I did not spend too much time adding significant detail.
	Back-check	Thank you, Comment closed.
25.	Comment	Section 4.6 – States assumptions about the setback being hydraulically neutral. Does this mean you are assuming it will not affect flow splits? Or are you not concerned since you anticipate less flow in this reach due to the Sacramento Bypass widening?
	Response	Section 4.6 has been revised with input from management.

	Back-check	Thank you, Comment closed.
26.	Comment	Section 5.1, 1st paragraph, last sentence – Please add to this sentence that these are the without project floodplains.
	Response	This was added in.
	Back-check	Thank you, Comment closed.
27.	Comment	Section 5.3 needs a little more information so the reader doesn't wonder what the purpose of the project is if we are not changing the floodplains or residual risk. In the first sentence when stating that the floodplains remain unchanged, add an explanation that while they remain unchanged the chance of breaching is reduced.
	Response	Further explanation was added to the first paragraph in Section 5.3
	Back-check	Thank you, Comment closed.
28.	Comment	Plates 34 – 41 – The index point RMs are provided to four decimal places, I doubt that you have quite that accuracy, perhaps only provide to the tenth place. Also, was the HEC-RAS model accurate enough to provide values to the hundredth place?
	Response	The RMs were changed to only represent the hundredth place. The detail in RM was kept so it can match the HEC-RAS RMs. The water surface elevation data was rounded to represent stages to the tenth place (not hundredths).
	Back-check	Thank you, Comment closed.
29.	Comment	Plate 34 – For Index Point 1 at RM 61.4986, the flows are all listed as N/A, which I understand that you did that for when there is reverse flow in the system, but for the lower flows, can you list the appropriate flow data?
	Response	Flows for the 2year and 10year events were added into the table.
	Back-check	Thank you, Comment closed.
30.	Comment	Section 6.2, last sentence – Suggest that you change "due to backwater effects" to "due to reverse flow and backwater effects, respectively"
	Response	This was changed.
	Back-check	Thank you, Comment closed.
31.	Comment	Table 6-5 needs to be filled out. Also, there is no table 6-2, 6-3, or 6-4, so consider renaming to table 6-2.
	Response	Table was changed to 6-2. Waiting for Economics analysis to be

		complete before filling out the table.
	Back-check	Comment remains open until table is complete.
	Response	Table was filled out by Econ Section and added in.
	Back-check	Thank you, Comment closed.
32.	Comment	Section 7.1, last paragraph – I believe there is only one weir in the West Sac project area that diverts water to the Yolo bypass, please correct. Also, consider adding a map showing the incidental low areas that will likely overtop first.
	Response	This was corrected. Low spots can be seen in Plates 6-10 where the water surface profile for n-year events is compared to the levee profile. Also, in Plate 21 that shows locations of height deficiencies.
	Back-check	Thank you, Comment closed.
33.	Comment	Section 7.3 – This section references EC 1165-2-211 and EC 1165-2-212 – both are documents on Sea Level change, but I believe with just different expiration dates. This report should be consistent on which document was used. Since this references the delta project, then it should probably be whichever EC they used.
	Response	The Dynamic Solutions analysis on the Delta used the EC1165-2-211. This is what is referenced.
	Back-check	Thank you, Comment closed.
34.	Comment	Section 7.3.5, second paragraph – First sentence states "no changes on the Sacramento at Verona" and then the next sentence states "difference in stage of two-tenths of a foot for the 10-yr event on the Sacramento River at Verona" These seem to contradict each other, please clarify.
	Response	It was a typo. There is two-tenths of a foot difference for Sacramento River at Freeport.
	Back-check	Thank you, Comment closed.
35.	Comment	Table 7-6 – Please verify the numbers in this box.
	Response	I double checked the numbers that Levee Safety Section gave me and seem to match. However, as noted in the documentation, these numbers are still draft and subject to change after presented to LSOG.
	Back-check	Thank you, Comment closed.
36.	Comment	Section 8.1, 2nd paragraph – This mentions more analysis is expected, is this going to be done by this project or a different project? When this is done, are you planning on updating this report?
	Response	Further analysis will be done by the West Sacramento GRR project. With SMART planning we do not have time or funding for detailed

		analysis; this will occur in PED.
	Back-check	Thank you, Comment closed.
37.	Comment	Section 8.1, 2nd paragraph – Mentions 3 alternatives, but there are 4 alternatives to this project, which 3 are you referring to or should all 4 alternatives be mentioned?
	Response	That was a typo. Erosion repair is included for all alternatives.
	Back-check	Thank you, Comment closed.
38.	Comment	Table 8.2 – Please move the title to the top of the table. Also, can you add a column as to which site was identified by which firm so that if someone wanted to look at the respective reports they will know which one to look in?
	Response	Table title was moved to the top. Adding more detail of which firm identified what site would make the table a little complicated as there were overlaps that were combined to one site. The intention of this was to be concise (SMART planning) and reference the URS and NHC documents if someone was seeking more detail.
	Back-check	Understood, Comment closed.
39.	Comment	Floodplain Maps – Can you please re-label these as "Inundation Maps" so as to avoid confusion with FEMA floodplain maps and because the flooding is the result of levee breaching.
	Response	The maps were re-labeled as "Inundation Maps"
	Back-check	Thank you, Comment closed.
40.	Comment	Table 8-2 – Can you show the identified erosion locations on a map?
	Response	Locations with erosion sites are shown in Plates 21-25 (Alternatives 1-5 all have the same erosion locations)
	Back-check	Thank you, Comment closed.
41.	Comment	Table 8-2 – Did your project look at the erosion sites identified by DWR's Flood Project Integrity and Inspection Branch's annual inspection? http://cdec.water.ca.gov/fsir.html Did you look at the erosion sites identified by the Sacramento River Bank Protection Project?
	Response	From the sites identified by URS and NHC studies, most of the Sacramento River (within the project area) has erosion problems. There are very few Sac Bank fixes within the project area.
	Back-check	Thank you, Comment closed.
42.	Comment	Section 8.4, second paragraph – Can you please add a map that shows the areas of high, medium, and low risk of failure due to

		wind?
	Response	Plate 42 was added; this shows areas of high, medium and low risk of failure due to wind. The plate was also referenced in the text of the document.
	Back-check	Please add text to this plate indicating that this is risk associated with wind.
	Response	Text indicating risk from wind wave was added.
	Back-check	Thank you, Comment closed.
43.	Comment	Section 8.5 – I think you might want to investigate erosion from boat wake a bit further, there are ocean-going yachts that travel through this reach and barge canals carrying tons of rock come through occasionally. There is also no speed limit or "no wake zone" in the majority of the Sacramento River. Was any analysis done to say it is insignificant?
	Response	An analysis was not done to say boat wave erosion is not significant. It is assumed it is not significant and that any boat wave erosion that may occur would be addressed by Sac Bank or by O&M.
	Back-check	Thank you, Comment closed.
44.	Comment	Section 8.6 – This section mentions the use of a waiver for vegetation. The ETL has the option for a variance, but a request must be made by the local sponsor, is the local sponsor prepared to ask for a variance and likely to get one? If they are not, then can we leave the vegetation in the designs?
	Response	The local sponsor will submit a variance request. The assumption at this point is it will likely be granted.
	Back-check	Thank you, Comment closed.
45.	Comment	Section 8.6 – There is mention of analyzing scour, it mentions the analysis will likely use HEC-18, can you confirm this is what will be used and take "likely" out of the sentence?
	Response	Since this work will be completed in PED we cannot say for certain which model will be used.
	Back-check	Thank you, Comment closed.

QUALITY CONTROL CERTIFICATE

Hydraulic Design/Analysis Section, Engineering Division

PROJECT NAME: WEST SACRAMENTO GENERAL RE-EVALUATION STUDY
PRODUCT: HYDRAULIC APPENDIX TO SUPPORT FINAL ARRAY OF ALTERNATIVES FOR WEST SACRAMENTO STUDY
Actual Completion Date: 17-Oct-13

PROJECT MANAGER: TOM KARVONEN

Background: [Include project description, technical products, and review methodology]

District Quality Control was performed for the West Sacramento General Re-evaluation Study on the Hydraulic appendix to support the final array of alternatives for the feasibility study.

The purpose of this document is to present the summary of hydraulic analyses conducted to support the West Sacramento GRR Study. This is an executive report of what has been traditionally known as a hydraulic appendix. A collection of technical memorandums (developed to support the Common Features GRR project) are referenced to provide detailed information typically found in a full version of the hydraulic appendix. This executive report has been prepared to meet the intention of the new Planning Modernization that USACE has undertaken.

Both Flo2D and HECRAS models were used for this effort.

HYDRAULIC LEAD

I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved all issues identified during District Quality Control (DQC) review.

Hydraulic Lead: Kristy Riley

Kristy Riley	Kristy Riley	10/17/13
Print name	Signature	Date

REVIEWERS

I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer: Morgan Marlatt Title: Senior Hydraulic Engineer

Morgan Marlatt		10/17/13
Print name	Signature	Date

RESOURCE PROVIDER

I have reviewed and resolved all critical and technical issues. I agree that all project requirements, standards of the profession, and USACE policies and standards have been met.

Acting Section Chief: Jesse Schlunegger

Jesse Schlunegger	Jesse Schlunegger	10-24-2013
Print name	Signature	Date

QUALITY CONTROL CERTIFICATE

Hydraulic Design/Analysis Section, Engineering Division

PROJECT NAME: WEST SACRAMENTO GENERAL RE-EVALUATION STUDY
PRODUCT: HYDRAULIC APPENDIX TO SUPPORT FINAL ARRAY OF ALTERNATIVES FOR WEST SACRAMENTO STUDY
Actual Completion Date: 14-Sep-15

PROJECT MANAGER: BRYON LAKE

Background: [Include project description, technical products, and review methodology]

Additional District Quality Control was performed for the West Sacramento General Re-evaluation Study on the updated portions of the Hydraulic appendix to support the final array of alternatives for the feasibility study. The DQC Certificate from August 13, 2013 still applies as this is an update to that review, not a replacement.

The purpose of this document is to present the hydraulic analyses conducted to support the West Sacramento General Re-evaluation Report (ARCF GRR) Study. This is a summary report of what has been traditionally know as a hydraulic appendix. A collection of technical memorandums (see table below) containing the detailed information typically found in a full version of the hydraulic appendix have been assembled as an office report for reference here at the District. This executive report has been prepared to meet the intention of the new Planning Modernization that USACE has undertaken.

Both Flo2D and HECRAS models were used for this effort.

Models and Technical Memorandums Supporting the ARCF Hydraulic Appendix
Hydraulic Models
HECRAS 1-D Hydraulic Model FLO2D 2-D Hydraulic Model
Technical Memorandums
Sacramento Basin HEC-RAS Phase I Model Development Sacramento Basin HEC-RAS Phase II Model Development Sutter Basin HEC-RAS Model Conversion Datum Conversion Downstream Boundary Conditions Gages Hydrologic Inputs (.dss files) Highwater Marks FDA Inputs FLO-2D Floodplain Mapping Documentation Levee Breach Sensitivity Climate Change Systems Risk and Uncertainty Interior Drainage Upstream Alternative Analysis Calibration ARCF-West Sac TSP Comparison DWSC vs Port Levees

HYDRAULIC LEAD

I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved all issues identified during District Quality Control (DQC) review.

Title: Senior Hydraulic Engineer Gene Maak		14 Sept 2015
Print name	Signature	Date

REVIEWERS

I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer: Jesse Schlunegger	Title: Hydraulic Analysis Section Chief	14-Sept-2015
Print name	Signature	Date

RESOURCE PROVIDER

I have reviewed and resolved all critical and technical issues. I agree that all project requirements, standards of the profession, and USACE policies and standards have been met.

Section Chief: Jesse Schlunegger		14-Sept-2015
Print name	Signature	Date

QUALITY CONTROL CERTIFICATE

Hydraulic Design/Analysis Section, Engineering Division

PROJECT NAME: WEST SACRAMENTO GENERAL RE-EVALUATION STUDY
PRODUCT: HYDRAULIC APPENDIX TO SUPPORT FINAL ARRAY OF ALTERNATIVES FOR WEST SACRAMENTO STUDY
Actual Completion Date: 17-Oct-13

PROJECT MANAGER: TOM KARVONEN

Background: [Include project description, technical products, and review methodology]

District Quality Control was performed for the West Sacramento General Re-evaluation Study on the Hydraulic appendix to support the final array of alternatives for the feasibility study.

The purpose of this document is to present the summary of hydraulic analyses conducted to support the West Sacramento GRR Study. This is an executive report of what has been traditionally known as a hydraulic appendix. A collection of technical memorandums (developed to support the Common Features GRR project) are referenced to provide detailed information typically found in a full version of the hydraulic appendix. This executive report has been prepared to meet the intention of the new Planning Modernization that USACE has undertaken.

Both Flo2D and HECRAS models were used for this effort.

HYDRAULIC LEAD

I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved all issues identified during District Quality Control (DQC) review.

Hydraulic Lead: Kristy Riley

Kristy Riley	Kristy Riley	10/17/13
Print name	Signature	Date

REVIEWERS

I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer: Morgan Marlatt Title: Senior Hydraulic Engineer

Morgan Marlatt		10/17/13
Print name	Signature	Date

RESOURCE PROVIDER

I have reviewed and resolved all critical and technical issues. I agree that all project requirements, standards of the profession, and USACE policies and standards have been met.

Acting Section Chief: Jesse Schlunegger

Jesse Schlunegger	Jesse Schlunegger	10-24-2013
Print name	Signature	Date

HYDROLOGY SECTION

CERTIFICATION FOR AGENCY TECHNICAL REVIEW

West Sacramento General Reevaluation Report
Yolo County, California
Hydrologic Study

GENERAL FINDINGS

Compliance with clearly established policy, principles, and procedures, utilizing clearly justified and valid assumptions, has been verified for the subject project. This includes assumptions, methods, procedures and materials used in the analyses; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the product meets the customers' needs consistent with law and existing U.S. Army Corps of Engineers criteria and policy.

In accordance with CESPD R 1110-1-8, South Pacific Division Quality Management Plan, May 2000, this letter certifies that the without-project hydrology is appropriate as the basis for use in the hydraulic analysis for the West Sacramento General Reevaluation.

This quality control certification includes the 50% through 0.2% chance flood hydrographs on the Sacramento River and Yolo Bypass in the vicinity of West Sacramento, which is based on the Comprehensive Study Latitude of Sacramento flood centering. The concurrent American River flows in this centering include existing conditions operations for Folsom Dam (SAFCA diagram) with a 145,000 cfs maximum objective release and a future condition Joint Federal Project (JFP) with a maximum objective release of 160,000 cfs. Development of a new Water Control Diagram is in progress that may change the future condition flows, although the maximum objective release is not expected to change.

I certify that an independent technical review of the project indicated above has been completed and that all technical issues have been identified and resolved. I recommend certification that the quality control process has been completed.

John M. High, Section Chief
Hydrology Section, SPK

10/19/2010
Date

Gregory A. Kukas, Branch Chief
Hydrology & Hydraulics Branch, SPK

10/19/2010
Date

QUALITY CONTROL CERTIFICATE
Real Estate Division, Acquisition and Management Branch

PROJECT NAME: WEST SACRAMENTO GRR

PRODUCT: REAL ESTATE APPENDIX FOR FRM MILESTONE ACTUAL
COMPLETION DATE: SEPTEMBER 2015

PROJECT MANAGER: BRYON LAKES

The Real Estate Appendix is intended to inform the reader of the major Real Estate factors which were considered in the investigation and influenced decisions documented in the main report. It also presents a summary of the real estate costs, inventory, and analysis and assumptions associated with the lands, easements, right of way, relocations and disposal required for the tentatively selected plan. This DQC effort has verified that the Real Estate analysis is compliant with clearly established U.S Army Corps of Engineers policies, regulations, and that the assumptions, methods, data and tools used are appropriate for purposes of a real estate plan and that the level of detail and scope are reasonable and consistent within the context of the Real Estate Appendix.

REAL ESTATE LEAD
I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved issues identified during District Quality Control (DQC) Review.

Lead Realty Specialist: Name
Laurie Parker
Print Name

Laurie Parker
Signature

Sept 1, 2015
Date

REVIEWER
I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer: Name

Paul Zianno
Print Name

Title: Chief, Civil Works Section

Signature

Sept 1, 2015
Date

West Sacramento Real Estate Plan September 2015
DQC Comments
Reviewer: Paul Zianno, Chief, Civil Works Section

REPORT SYNOPSIS

DQC COMMENT	RESPONSE	BACK CHECK
Based on previous comments from HQ, make sure the maps are attached to the RE Plan and not on a DVD. You can send the DVD, just make sure the maps are attached to the REP.	Will include hyperlink in the document in lieu of a DVD. The reviewer can click on the link and the data will come up instantly	X
Please identify what the letters mean on the map. Need to identify as phases.	Concur	X
After reading through this section it needs to be rewritten describe in specific detail with the description of the estates required. List all of the estates required for this project and under each one describe the location, acreage, owner description (private or non-federal), tract #. Laurie, Please identify what the letters mean on the map. Need to identify as phases.	Concur – rewriting section as stated above	X
Is this a Road Easement?	Yes it is a Road Easement	X
This is a non-standard estate?	No the mitigation is at a bank or on site. It could potentially become non standard if fee is not available on site.	X
This is also a non-standard estate?	Due to the SWIF variance this is no longer a requirement of the project and these section will be removed from the report	X
You need to include specifically and spell out each estates required for the project. Also, include the acreage, tract numbers and the number of and type owners impacted by this acquisition. Adding a Table showing all the estates with the required information might be beneficial to the reader.	Concur the table will be shown in Section 4. Description of LERRD's.	X
Is this a Road Easement?	No This was a vegetative free zone. Due to the SWIF variance it is no longer needed and will be removed from this report	X
What does the Letters mean in the Figure please specify. Page 24	I will provide a definition of the letters in the report.	X
We need to expand this paragraph on how we are going to apply Navigational Servitude. The ER 405 talks specific to the requirements.	Will include longer discussion.	X
Briefly describe these relocations	Concur	X

QUALITY CONTROL CERTIFICATE

Economic Risk Analysis Section, Planning Division

PROJECT NAME: WEST SACRAMENTO GRR, CALIFORNIA
PRODUCT: ECONOMIC APPENDIX
Actual Completion Date: 14-Aug-15
PROJECT MANAGER: BRYON LAKE

The economic analysis noted below describes in a clear and concise manner the major assumptions, methods, data, and analytical tools used in the analysis, and summarizes the results of the analysis using table and text formats. This DQC effort has verified that the economic analysis is compliant with clearly established U.S. Army Corps of Engineers policies, principles and procedures; that the assumptions, methods, data and analytical tools used are appropriate for purposes of an economic analysis; that the level of detail and scope of the analysis are appropriate for purposes of an economic analysis; and that they results are reasonable and consistent within the context of an economic analysis.

Specific product reviewed: This DQC review focused on the updated net benefits and benefit-to-cost ratios and other changes incorporating review comments. There was also a cursory review of the entire document. Also reviewed were the FDA files and methodology for Emergency and Cleanup costs. This iteration represents the draft FINAL Economic Appendix for the FRM milestone and the CWRB.

ECONOMIC LEAD

I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved all issues identified during District Quality Control (DQC) review.

Lead Economist:	Title: Economist	
Timi Shimabukuro	SHIMABUKURO.TIMI.R.1232082522 Digitally signed by SHIMABUKURO.TIMI.R.1232082522 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=SHIMABUKURO.TIMI.R.1232082522 Date: 2015.08.14 08:34:05 -07'00'	14 Aug 2015
Print name	Signature	Date

REVIEWER

I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer:	Title: Chief, Economic & Risk Analysis Section	
Nicholas Applegate	APPLEGATE.NICHOLAS.JAMES.1246006640 Digitally signed by APPLEGATE.NICHOLAS.JAMES.1246006640 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=APPLEGATE.NICHOLAS.JAMES.1246006640 Date: 2015.08.13 23:27:22 -07'00'	14 Aug 2015
Print name	Signature	Date

RESOURCE PROVIDER

I have reviewed the quality control process and ensured that comments have been adequately address, documented and resolved.

Section Chief:	Title: Chief, Economic & Risk Analysis Section	
Nicholas Applegate	APPLEGATE.NICHOLAS.JAMES.1246006640 Digitally signed by APPLEGATE.NICHOLAS.JAMES.1246006640 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=APPLEGATE.NICHOLAS.JAMES.1246006640 Date: 2015.08.13 23:28:24 -07'00'	14 Aug 2015
Print name	Signature	Date

Economic and Risk Analysis Section
District Quality Control Review Comments
West Sacramento GRR
August 2015

Comments submitted by: Nick Applegate, Chief, Economic Risk Analysis Section, SPK
Responses submitted by: Timi Shimabukuro, Regional Economist
Backcheck submitted by: Nick Applegate, Chief, Economic Risk Analysis Section, SPK

Editorial Comments:

1. **Comment:** In many cases throughout this document (and in ARCF), we refer to the "SPK Hydraulic Analysis Section" or the "Sacramento District Hydrology Section." We are trying to get away from district specific references in our documentation. Instead, this is a USACE document. Recommend removing district specific references and replacing them with more general USACE references, or not references at all. For example, in Section 2.8.2 it says "The SPK Hydraulic Design Section used the HEC-RAS model to determine stages…" Instead, we can just say "The HEC-RAS model was used to determine stages…"
   Response: Concur. All references to specific District sections have been removed.
   Backcheck: Verified, comment closed.

2. **Comment:** Pg 3-18. Footnote 2. This footnote bleeds onto the next page. May want to fix that if possible.
   Response: Concur. This will be fixed for the Final version of the report.
   Backcheck: Comment closed.

Technical Comments:

3. **Comment:** Section 2.7.1, par 2. Text indicates that "There are over 18,000 structures at risk of flooding,' but Table 1 only says 13,838. Please recitify.
   Response: Concur. The sentence has been revised to read, "There are close to 14,000 structures…"
   Backcheck: Verified, comment closed.

4. **Comment:** Sec 2.7.6, par 2. "An average value of an automobile was determined to be $8,300." This number differs from the $8,549 number described in section 2.7.4. Please rectify or clarify this discrepancy.
   Response: Concur. The sentence in Section 2.7.6 has been revised to read "$8,549."
   Backcheck: Verified, comment closed.

5. **Comment:** Sec 3.3.2, par 2. "Expected annual damages associated with a levee breach along the Yolo Bypass are estimated to be approximately $288 million." Following this text, Table 7 indicates $297 million in EAD. Please rectify discrepancy.

Response: Concur. The sentence in Section 3.3.2 has been revised to read "$297 million."
Backcheck: Verified, comment closed.

6. **Comment:** Table 17 and Table 20. Why do there appear to be no benefits to doing a levee raise for IP3 and IP6?
   Response: Either there are no levee raises being proposed (IP 3) or levee raises do not provide any additional benefit (IP 3 and IP 6) in these reaches.
   Backcheck: Comment closed.

7. **Comment:** Table 31. Gets back to my previous comment. Why is there no benefit to the levee raises for IP 3? We should better explain somewhere in the document why this is (or maybe I just missed it).
   Response: There are no levee raises being proposed at IP 3; however, a sensitivity analysis was performed by raising the top of levee at this index point location – levee raises do not provide any additional benefit. A statement noting this has been added to Section 4.3 (last paragraph).
   Backcheck: Verified, comment closed.

8. **Comment:** Table 32-34 footnote. "additional hydraulic modeling of Alternative 5 will occur in the future." The future is now! Since this is the final report, we either need to make the change or remove this footnote.
   Response: Concur. No additional hydraulic modeling has been completed. Therefore, the statement in these footnotes referring to additional modeling has been removed.
   Backcheck: Verified, comment closed.

9. **Comment:** Section 4.10. Change net benefit text from $160 million to $161 million.
   Response: Concur. This revision has been made.
   Backcheck: Verified, comment closed.

10. **Comment:** Section 4.10. Change title to "*TENTATIVE* IDENTIFICATION OF NATIONAL ECONOMIC DEVELOPMENT (NED) PLAN
    Response: Concur. "Tentative" has been added to the section title.
    Backcheck: Verified, comment closed.

11. **Comment:** Section 4.11.4. Change title to "*FINAL* Updated Net Benefit/BCR Analyses for the Recommended Plan (Alternative 5)
    Response: Concur. "Final" has been added to the section title.
    Backcheck: Verifed, comment closed.

12. **Comment:** Attachment Title Page. The current title page only lists RED/OSE as an attachment, but there appear to also be Floodplains and geotech curves. Please edit the title page as appropriate.
    Response: There are two attachment title pages – one for RED/OSE and another one for the Engineering Supporting Data.
    Backcheck: Comment closed.

13. **Comment:** There were no TPCS cost tables included in the attachments, so I could not verify costs were used correctly (i.e. cultural resources costs removed from the economic analysis per USACE policy). Please add TPCS tables if they exist. This can be done when the FINAL certified costs are made available and price levels/rates are updated to Oct. 15.
    Response: Concur. The cost estimate for the Recommended Plan will be included as an attachment to the Economic Appendix when the final certified costs are available and during the next update (around October 2015) of the Economic Appendix. (Cultural preservation resource costs have been excluded from the analysis.)
    Backcheck: Thanks, comment closed.

HEC-FDA Comments (Emergency/Cleanup):

14. **Comment:** The FDA models and output files associated with Emergency costs were reviewed and there were no significant issues. The Inventory values were input correctly using $10/square foot for cleanup costs on all structures and $11,244 for all residential structures for Temporary Housing assistance. Depth-damage curves were appropriately applied. The results and proportions relative to structure/content damages are consistent with the findings of the Authorized Sutter feasibility study (which used a similar methodology). Adding these categories into the final array makes the Economic analysis more complete. No response necessary.
    Response: No response necessary.
    Backcheck: Comment closed.

DISTRICT QUALITY CONTROL CERTIFICATION
WEST SACRAMENTO GENERAL REEVALUATION REPORT, YOLO COUNTY, CALIFORNIA

COMPLETION OF QUALITY CONTROL ACTIVITIES

The District has completed review of the West Sacramento General Reevaluation Study. Products reviewed include the final report, report synopsis, slide presentation, risk register, decision log and decision management plan. Certification is hereby given that all quality control activities defined in the Project Review Plan appropriate to the level of risk and complexity inherent in the product have been completed. Documentation of the quality control process is enclosed.

GENERAL FINDINGS

Compliance with clearly established principles and procedures, utilizing clearly justified and valid assumptions, has been verified. This includes assumptions, methods, procedures and materials used in analyses; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the product meets the sponsor's needs consistent with law and existing Corps policy. Cost data in the review copy of the document was DQC'd concurrent with ATR; however the District has yet to receive the certified final costs. Any changes resulting from the final cost certification will be reviewed prior to the Civil Works Review Board.

Based on documented policy concerns received during concurrent review, the DQC review included a consistency review between this project's document and the American River Common Features General Reevaluation Report to ensure a consistent response to ATR and policy comments, where applicable. DQC comments were provided based on this additional consistency review.

All appropriate DQC comments have been incorporated into this project.
The undersigned recommends certification of the quality control process for this product.

Jerry Fuentes
Quality Control Reviewer

Date 9/4/15

QUALITY CONTROL CERTIFICATION

As noted above, all issues and concerns resulting from technical review of the product have been resolved. The project is recommended to proceed to policy review by SPD.

QUALITY CONTROL CERTIFICATION

As noted above, all issues and concerns resulting from technical review of the product have been resolved. The project is recommended to proceed to policy review by SPD.

Nick Applegate

9/14/15

for Mark E. Cowan
Chief, Water Resources Branch

Date

West Sacramento Draft Final Report
DQC Comments
Reviewer: Jerry Fuentes, RTS

24 August 2015

Comment	Response	Backcheck
Page 1-2, section 2.0 - Citation format is incorrect. Revise per OC guidelines.	Concur – Citation Format Revised	Response accepted. Comment Closed.
Page 1-3, Figure 1 - use of rectangle for depicting Study Area doesn't match narrative description.	Concur – Rectangle depicting study area removed from map.	Response accepted. Comment Closed.
Page 2-6, section 2.4 - next to last sentence: replace "study" with "project."	Concur – change made	Response accepted. Comment Closed.
Page 2-6, section 2.4 - last sentence: Add "benefits" to "all potential effects."	Concur – benefits added to sentence.	Response accepted. Comment Closed.
Page 4-7, section 4.2, first paragraph: Be specific about "minimal warning or evacuation times."	Concur – text was revised to be more specific.	Response accepted. Comment Closed.
Page 4-7, section 4.2, first paragraph: Would the railroad be impassable from any flood or a specific one?	Concur – pending response from hydraulics reference to railroad was removed from sentence.	Response accepted. Comment Closed.
Page 4-8, section 4.4, bullet 4: Suggest you state specifically whether the mprovements are either in-place or not in place rather than say "part of the without project condition."	Concur – text revised to indicate the improvements are in place.	Response accepted. Comment Closed.
Page 4-8, section 4.4, bullet 5: Is the assumption that development would be constrained until 100-year protection is achieved consistent with SB-5?	Concur – included language regarding requirements of SB-5	Response accepted. Comment Closed.
Page 3-17, after Alternative 8: Suggest at least a brief discussion in the text about methodology for preliminary costs and benefits. Although footnote in Table 7 addresses costs, it really should be in text.	Concur – Included information from footnote in text above Table.	Response accepted. Comment Closed.
Page 4-39, Table 4-10: Costs for levees is roughly $10 K more per mile than Common Features.	Concur – Cost differences are due to various factors including: the use of different contingencies, differences in existing conditions, and design criteria, such as slurry wall depth. The latest revised cost is approximately $90 million less in the MCACES Account 11 than was presented in the table.	Response accepted. Comment Response accepted. Comment Closed. Closed.
Page 4-39, Table 4-10: Costs for bank protection is half the cost per mile of Common Features.	Concur – The extent of bank protection for West Sac was revised based on feasibility level design and environmental agency comments.	Response accepted. Comment Closed.
Page 4-39, Table 4-10: Total Cost is different than in Table 4-8.	Concur - Costs will be revised and made consistent once Cost ATR and Certification are completed.	Response accepted. Comment Closed.
Page 4-40, Table 4-11: Lands & Damages	Concur – The Federal Admin costs	Response accepted.

account should include Federal admin costs.	will be included once RE costs are resolved.	Comment Closed.
Page 4-41: Should include a discussion of Environmental Operating Principles and USACE Campaign Plan.	Concur – discussion of EOP and the Campaign Plan has been added to Chapter 4.	Response accepted. Comment Closed.
Page 5-2, Section 5.3: Update interest rate to 3.375%	Concur. Updated.	Response accepted. Comment closed.
Page 5-4, Table 5-3: Suggest deleting this table since it does not show any crediting and is already part of Table 5-4.	Concur. Table has been deleted.	Response accepted. Comment Closed.
Page 5-5, Section 5.5: Should include that the total is included for reference.	Concur. Text added.	Response accepted. Comment closed.
Page 5-5, Table 5-4, GRR costs are inconsistent with Table 4-5.	Concur - Costs will be revised and made consistent once Cost ATR and Certification are completed.	Response accepted. Comment Closed.
Page 6-4, Section 6.8: Second sentence should start with "Coordination with..."	Concur. Text added.	Response accepted. Comment closed.
Page 7-1: Recommendations should include specifics.	Concur. Updated.	Response accepted. Comment closed.
Page 7-2, Third sentence is repetitive and should be deleted.	Concur. Deleted.	Response accepted. Comment closed.
PACR - Cost tables are inconsistent with GRR.	Concur - Costs will be revised and made consistent once Cost ATR and Certification are completed.	Response accepted. Comment Closed.
PACR -16 Section 6: Include a brief summary of areas of concern in review comments	Concur. Text added.	Response accepted. Comment closed.
PACR-17, Section 17 - change to Section 7.	Concur. Change made.	Response accepted. Comment closed.

West Sacramento GRR

Appendix B

Review Documentation

Agency Technical Review (ATR)

Documentation

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FLOOD RISK MANAGEMENT
PLANNING CENTER OF EXPERTISE
REVIEW MANAGEMENT ORGANIZATION'S

AGENCY TECHNICAL REVIEW REPORT, SEPTEMBER 2015

Of the:

WEST SACRAMENTO PROJECT
FINAL GENERAL REEVALUATION REPORT, AND FINAL ENVIRONMENTAL IMPACT STATEMENT /ENVIRONMENTAL IMPACT REPORT
SEPTEMBER 2015

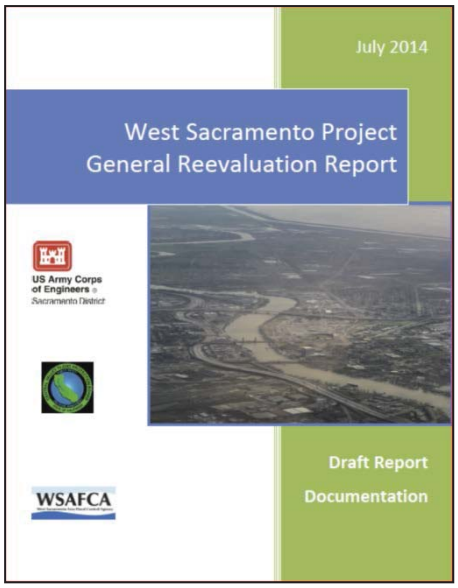
Sacramento District

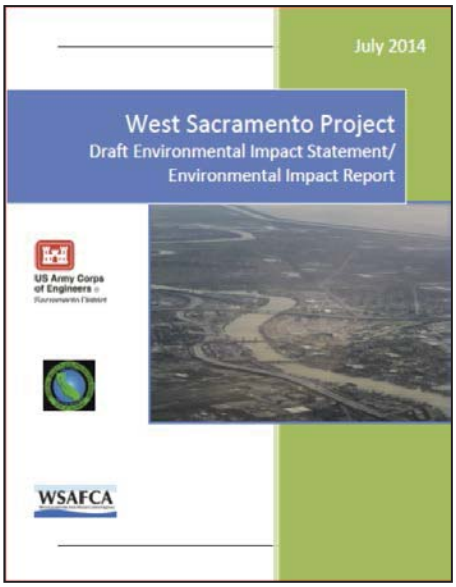
US Army Corps of Engineers ®

TABLE OF CONTENTS

Agency Technical Review Report

Subject: Review report for the **WEST SACRAMENTO PROJECT, FINAL GENERAL REEVALUATION REPORT, AND FINAL ENVIRONMENTAL IMPACT STATEMENT /ENVIRONMENTAL IMPACT REPORT, SEPTEMBER 2015**, Sacramento District. Document covers below show the draft general reevaluation report and National Environmental Policy Act document covers as examples of the final report covers. At the request of the review team lead, the District provided track change documents to the review team to facilitate examination of the changes made to the report between the draft (July 2014) and final (August 2015) versions. Final report cover versions were not necessary.





1. Scope and Purpose of Review. The purpose of this review report was to document agency technical review (ATR) for the subject products. The review was conducted for the Sacramento District. The point of contact for the District was Andrew T. Muha, CESPK-PPMD. The ATR team (ATRT) was lead by Marc L. Masnor, CESWF-PEC-PF (Tulsa, OK). The Flood Risk Management Planning Center of Expertise (FRM-PCX) was the Review Management Organization responsible for managing the ATR. The review documents will be referred to as the final GRR and the draft EIS/EIR.

Six targeted ATR work product reviews were conducted as part of the review of the draft GRR and draft EIS/EIR between January 2014 and February 2015. The work products consisted of GRR appendices for geotechnical

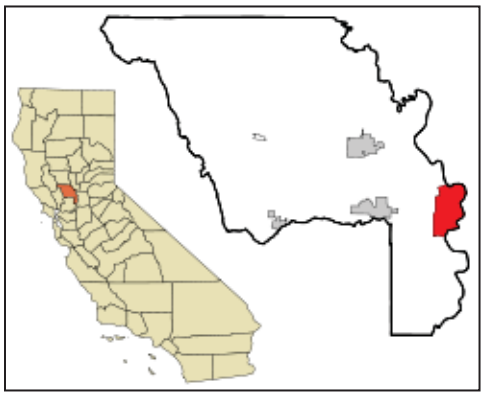
engineering, economics, hydrology and hydraulic engineering, and civil engineering; the real estate plan, and detailed cost engineering estimates and supporting documentation. Some work product comments were backchecked subsequent to review of the draft GRR and the draft EIS/EIR.

The draft GRR and draft EIS/EIR were reviewed between July 2014 and January 2015.

Review of the final GRR was conducted in August and September 2015. This review report documents the ATR of the final GRR and the NEPA document and all supporting documents.

2. References.
a. This review report was prepared in response to EC 1165-2-214, 15 December 2012, Water Resources Policies and Authorities, CIVIL WORKS REVIEW.
b. The review documents reside online at ProjNet™ (www.projnet.org). The Projnet™ DrChecks Project and Review titles are: Project: (320653) West Sacramento General Reevaluation Report (GRR) (incl ATR & DQC Reviews)(P2# 320653) and Review: ATR Final GRR (7-28 Aug 2015).

3. Project Description. The purpose of the West Sacramento Project is to reduce the flood risk for the City of West Sacramento (below right, right insert), California (below left), Yolo County (below right, left insert). The general reevaluation report (GRR) documented evaluation of proposed system improvements and additional levee improvements and other measures to provide flood risk management for the City of West Sacramento.



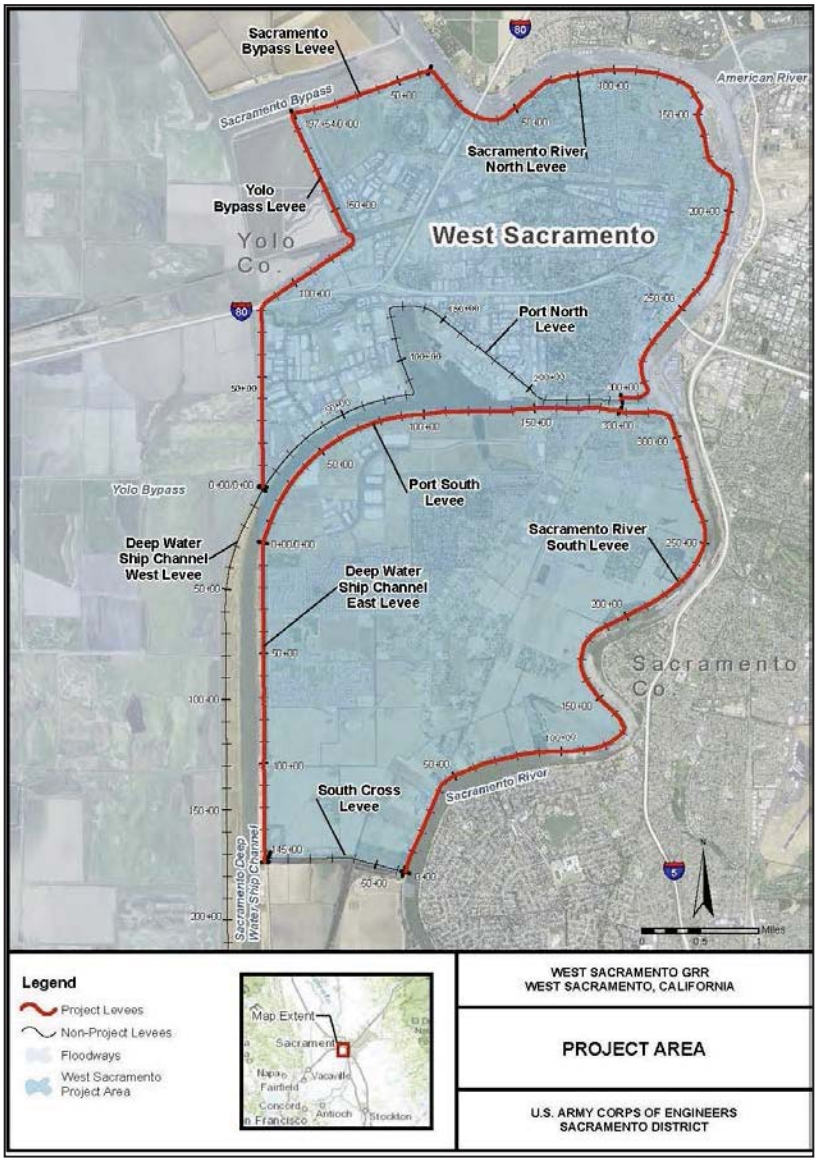
The study area approximately corresponds with the city limit for the City of West Sacramento comprising 13,000 acres of mixed-use land and an

estimated population of 48,000 residents. The City of West Sacramento is located directly across the Sacramento River from the City of Sacramento, the State's Capitol.

The project area is almost completely bound by floodways and levees [graphic next page]. The study area is bound by the Yolo Bypass to the west, the Sacramento Bypass to the north, and the Sacramento River to the east. Further, the City is bifurcated by the Sacramento River Deep Water Ship Channel (DWSC) and Barge Canal. The associated levee system currently protecting the study area includes nearly 50 miles of levees in Reclamation District (RD) 900, RD 537, Maintenance Area 4, and along the DWSC and Barge Canal.

Northern Sub-basin – The northern sub-basin, representing approximately 6,100 acres, is bounded by the Port North area and the DWSC to the south, the Sacramento River North Levee to the north and east, the Sacramento Bypass Levee to the north, and the Yolo Bypass Levee to the west. The right bank of the Sacramento River extends for approximately 5.5 miles of the northern and eastern sides of the basin.

Southern Sub-Basin – The Southern Sub-Basin encompasses approximately 6,900 acres and varies from El. 18.0 feet to El. 8.0 feet. The area is bounded by the Port South Levee and the DWSC to the north, the Sacramento River South Levee to the east, the South Cross Levee to the south, and the DWSC East Levee to the west. The right bank of the Sacramento River extends for approximately 6.2 miles on the east side of the basin.



A majority of the levees within the study area are part of the Sacramento River Flood Control Project. The few exceptions are the Port North area and Port South levees, the DWSC West levee and the South Cross levee. The Port South and DWSC West levees were constructed as part of the Port of Sacramento.

The Port North area includes high ground along the northern portion of the Port of West Sacramento. The South Cross levee is a private levee. Although the DWSC West levee was constructed as part of the navigation project supporting the Port of West Sacramento, this levee provides significant flood benefits to portions of both the northern and southern sub-basins. The Corps currently maintains this navigation levee.

4. Review Team. The following team members met the requirements of the District and RMO.

ATRT Lead – Marc Masnor P.E., Civil Engineer, CESWF-PEC-PF (Tulsa, OK) – 918-669-7349, Marc.L.Masnor@usace.army.mil. Mr. Masnor is a civil works water resources planner in the Plan Formulation Section of the Southwestern Division Office (SWD) Regional Planning and Environmental Center (RPEC), headquartered in the Fort Worth District Office (CESWF) in Fort Worth, TX. He works from the Tulsa District Office (CESWT) in Tulsa, OK, 1645 S. 101st East Ave, Tulsa, OK 74128-4609. He has 37 years of experience with the Corps of Engineers, Tulsa District, Tulsa, OK. Marc is a SWD regional technical specialist (RTS) for plan formulation and National Environmental Policy Act evaluation of flood risk management (FRM), ecosystem restoration (ECO), and water management and reallocation studies (WMRS). As a senior plan formulation specialist and regional technical specialist, he assists in the development of unique or complex formulation and analysis techniques within the framework of Corps of Engineers guidance; Federal, state, and local laws and regulations; and stakeholder interests. He has been both study manager and project manager for many Tulsa District planning studies that involved flood risk management, ecosystem restoration, comprehensive watershed studies, water supply, reservoir storage reallocation, navigation, hydropower, and chloride control. Mr. Masnor has worked in hydrology, design, project management, and civil works planning offices within the Tulsa District and has completed a wide variety of water resources studies in Kansas, Oklahoma, and Texas. Studies included the evaluation of navigation and hydropower expansion on the McClellan-Kerr Navigation system; a system of 122 small reservoirs in the Grand-Neosho Basin; chloride control evaluations in the Arkansas and Red River Basins; multiple purpose reservoirs system formulation; storage reallocation studies, regional needs studies; watershed ecosystem

restoration evaluations; and several local levee, channel, detention, and buyout plans. He currently provides support for offices within (a) the RPEC and Districts within SWD, (b) three planning centers of expertise (PCX) review management organizations (RMO) for FRM, ECO, and WMRS, (c) multiple division office RMOs across the Corps, and (d) the Risk Management Center (RMC). He has participated in or lead roughly 100 ATRs or DQCs.
(a) He supports the RPEC and the SWD as the plan formulation RTS, as an agency technical review (ATR) team member or team lead for continuing authority projects, as a district quality control (DQC) team member, and as a project delivery team (PDT) member.
(b) He supports three PCX RMOs as an ATR Team lead. In that capacity he selects and manages ATR teams to analyze pre-authorization feasibility studies conducted by Districts related to flood risk management, water management and reallocation, ecosystem restoration, and navigation. He has been the Southwestern Division Regional Manager for the FRM PCX National Manager, Eric Thaut (SPD) since 2008 through the present. Marc participates in a national team that develops tools in support of the PCX RMOs managing body called the PCX Guild. This team meets at the direction of the Guild to prepare supplemental review tools such as checklists, templates, and training materials for ATR and PDT teams.
(c) He supports Division RMOs as an ATR lead. In that capacity he selects and manages ATR teams to analyze post-authorization implementation studies including design documentation reports (DDR) and detailed project reports (DPR), and plans and specifications (P&S), generally for FRM, ECO, and WMRS. Other reviews include building replacements, water quality project modifications, and an upcoming desalinization plant.
(d) He supports the RMC RMO as an ATR lead, also to select and manage ATR teams for review of feasibility and implementation documents.

Plan Formulation and Policy – Douglas E. Lilly, CESWF-PEC-PF (Tulsa, OK), 918-693-7196, Douglas.E.Lilly@usace.army.mil. Mr. Lilly is a lead water resources planner for the U.S. Army Corps of Engineers, Tulsa District. Mr. Lilly also serves as Project Manager for assigned projects. His professional experience includes planning and management of watershed studies and projects for flood control, stream bank erosion, and ecosystem restoration in southern Kansas, Oklahoma, northern Texas, and the western United States. Mr. Lilly began his Corps career as a study manager in February 1987 in the Planning and Environmental Division. Prior to his Corps career, he worked as a structural engineer at a consulting engineering firm in Tulsa, Oklahoma. Mr. Lilly is a native Oklahoman. He graduated from Oklahoma State University with a Bachelor's Degree in Architecture and a Master's Degree in Architectural Engineering.

Biologist - Michael Scuderi, CENWS-PM-ER - 206-764-7205 michael.r.scuderi@usace.army.mil. Mr. Scuderi has been with the Corps of Engineers since 1983 serving initially in Los Angeles District (1 ½ years) and then Seattle District (27 years). He received a B.A. (Double major Geography and Economics) from UCLA in 1978. He also completed his M.A. in Geography (emphasis on Resource Management) from the University of Washington in 1981. Mr. Scuderi has worked on a variety of large and small Flood Control, Restoration and Military projects, being responsible for environmental compliance and design for those projects. He is currently a Senior Biologist in the Seattle District Environmental and Cultural Resource Branch focusing on directing restoration projects and is the Lead Environmental Coordinator for the Green-Duwamish Ecosystem Restoration Project covering the construction of 45 restoration projects in the Green-Duwamish Watershed. Mr. Scuderi is also the ECO-PCX Account Manager for LRD, and is a member of the Corps of Engineers Research Directorate Environmental Research Area Review Group, and the environmental representative for the Corps National Levee Vegetation Variance ATR team.

Environmental Compliance/Cultural – Ron W. Deiss, CEMVP-PD-P - 309-794-5185 ronald.w.deiss@usace.army.mil. Mr. Deiss is a graduate from Illinois State University, Normal, Illinois with a B.S. Comprehensive Anthropology, Minor in Historic Geography and a Master's of Science in Historic Archeology. His field work since 1975 in archeology, architecture, underwater, and historic research includes the states of Florida, Illinois, Indiana, Iowa, Kentucky, Louisiana, North Dakota, Maryland, Minnesota, Montana, and Tennessee. He has been employed by the Rock Island District since 1988 conducting environmental studies, archeological and architectural contracts, and planning documents. He has participated in ITR, ATR, and IEPR, and has served as a resource and mentor for his colleagues and proficient on the National Environmental Policy Act and National Historic Preservation Act. Of the most complex and sensitive projects in which he was a Team member include the Great Lakes and Mississippi River Interbasin Study, Lockport Pool Rehabilitations on the Chicago Sanitary and Ship Canal, Illinois River Basin Comprehensive Management Plan, Upper Mississippi River System Navigation Feasibility Study, and the Major Rehabilitation for the Upper Mississippi River and Illinois Waterway. Presently, Mr. Deiss is the St. Paul District Corps of Engineers District Archeologist, the Rock Island District Military Construction Coordinator, and the Rock Island District Native American Tribal Liaison. He is a certified member of the Register of Professional Archaeologists.

Hydrology and Hydraulic Engineer, CESWT – 918-669-7107, Russell.Wyckoff@usace.army.mil. Mr. Wyckoff graduated from Oklahoma State University in 1986 with a Bachelor of Science degree in Agricultural Engineering. He is a Registered Professional Engineer in the state of Oklahoma. He has worked for the U.S. Army Corps of Engineers for 23 years in the Tulsa District office. He currently serves as the Lead Hydraulic Design Engineer for Tulsa District in the areas of flood modeling and flood control structure design as well as Dam and Levee Safety. He has also integrated detailed terrain analysis and GIS (Geographic Information System) applications as part of the modeling process. Mr. Wyckoff serves on a National Dam Safety Evaluation Team and has conducted several Risk Based Analyses in the field of Hydrology and Hydraulics. Current work includes modeling of dam break scenarios on multiple structures nationwide as well as levee certification modeling, all based on risk analysis framework.

Real Estate – Karen Vance, Real Estate Specialist, CEMVK-RE-E - 504-862-1349, Karen.E.Vance@usace.army.mil. Ms. Vance has been with the Corps of Engineers since 1999, serving initially at the Tulsa District (11 years) and then the New Orleans District (5 years). During her service with the Corps of Engineers, she has served in New Orleans following Hurricane Katrina in demolition and debris removal, and in Bagram, Afghanistan in real estate acquisition. She is currently a member of the Appraisal and Planning Branch in New Orleans, and serves as a planning team member for multiple projects. Ms. Vance has worked on a variety of large and small projects, including flood risk management, navigation, ecosystem restoration and military projects. She has specialized in working with a vertical team for planning real estate activities for large scale ecosystem restoration projects. She has been appointed a member of the Planning Centers of Expertise for Agency Technical Reviews, and has conducted reviews for a variety of complex projects. She currently serves as an instructor for Real Estate Planning Management and Control PROSPECT training, and provides training and advice on Real Estate issues for civil works project planning.

Economics - Brian Harper, IWR – 409-766-3886, Brian.K.Harper@usace.army.mil. Brian Harper has 20 years of experience as an economist and planner with the Corps of Engineers. Brian is presently a regional economist with the Galveston District. He previously worked as a senior economist/planner at the Institute for Water Resources and was chief of the economics section in the Alaska District from 2002-2006.Prior to those assignments, Brian was a regional economist with the Little Rock District. While at IWR, he worked with a team to develop and implement risk-informed planning processes, with a particular focus on flood risk management and coastal storm damage reduction. In Alaska his work included extensive involvement in small boat harbor and flood & coastal

storm damage evaluations. In the Little Rock District he conducted planning studies and economic evaluations across multiple Corps missions. He introduced risk analysis techniques into the District's evaluations of three hydropower projects in the mid-90's and served on the SWD regional technical team for hydropower rehab studies. Brian also incorporated risk & uncertainty analyses into flood damage reduction studies and completed many water supply reallocation, inland navigation, agricultural flood damage, and stream-bank erosion studies. He started his Corps career as a Dept of the Army intern with the Los Angeles District from 1989-1991. He works remotely from the Galveston District Office, Galveston, Texas.

Civil Design Engineer - Norman Gartner, CESWL - 501-324-5274, Norman.P.Gartner@usace.army.mil. Mr. Gartner serves as a Senior Civil Engineer and Design Coordinator in the Engineering and Construction Division. With 34 years of civil engineering experience, he has planned, designed and managed the construction on a wide range of civil works projects including site design; street improvements; water and sanitary sewer improvements; wastewater treatment facilities; water storage reservoirs; commercial and residential subdivisions; pumping systems; mass grading projects; erosion control projects; and drainage improvements including detention facilities, water quality facilities, wetland mitigation, wetland restoration, river diversion and lake pumping projects. Since joining the US Army Corps of Engineers in 2009, his responsibilities have included: preparation of plans and specifications, cost estimates, contract modification packages, technical reviews of studies and designs, and field office support. He is currently leading a multi-discipline design team for the $25,000,000 May Branch flood reduction project in Fort Smith, Arkansas. He is coordinating with the projects stakeholders to deliver a quality product to meet established scope, cost, and time requirements.

Cost Engineer - James G Neubauer, P.E. CENWW - 509-527-7332, James.G.Neubauer@usace.army.mil. Mr. Neubauer is the Technical Cost Engineering Lead for the Cost Engineering District of Expertise (DX) for Civil Works located in Walla Walla, WA. Jim has 12 years of civil and military cost engineer experience. He has been the lead estimator in Albuquerque, NM, Chief of Cost - Europe, and lead estimator Walla Walla, WA. He has 11 years civil works construction experience in Wyoming, Europe, and Walla Walla, WA. Mr. Neubauer has 5 years military and civil project manager experience for Europe and Albuquerque projects. Jim has participated on numerous technical review teams, including several projects with cost estimates greater than $1billion. Jim is the Cost DX ATR Coordinator, is a Certified Cost Engineer, and has his PM1 Certification.

Cost Engineer - Gary R. Smith, CENWW-EC - 651-731-3910, - grs52@comcast.net. Mr. Smith is a registered Professional Engineer in the state of Minnesota, has been a practicing engineer since 1974, and has a bachelors of science degree in civil engineering from the University of Minnesota. Mr. Smith joined the Corps of Engineers in July 1974 and serves as a Cost Engineer for the Technical Center of Expertise Cost Engineering.

Geotechnical Engineer – Brad J. Arcement, CEMVK-EC-GA - 601-631-5899 Brad.J.Arcement@usace.army.mil. Mr. Arcement is a licensed Professional Engineer in the state of Mississippi and has been a practicing geotechnical engineer since 1998. He has a bachelor of science degree in civil engineering from Louisiana Tech University and a masters degree from the University of Texas at Austin. Mr. Arcement joined the Corps of Engineers in June 2009 and serves as the Section Chief of the Analytical Section of the Geotechnical Branch of the Vicksburg District. He was selected as a Geotechnical Regional Technical Specialist for MVD in 2010. Prior to serving with the Corps Mr. Arcement spent 10 years as a consulting geotechnical engineer.

Hydraulic Engineer – Michael K. Deering P.E., Civil Engineer, CEIWR-HEC-WR - 530-756-1104, Michael.K.Deering@usace.army.mil. Mr. Deering is a senior hydraulic engineer with the Water Resource Systems Division, Institute for Water Resources and is the lead for the development of HEC-FRM and member of the GUMP team for updating various policy and technical guidance. His expertise includes flood risk management with risk analysis, impact analysis, ecosystem restoration, river hydraulics, stream stability and scour, surface water hydrology, water surface profile modeling, floodplain delineations, hydraulic structures. Mr. Deering has a BS, 1977 Civil Engineering, University California at Davis, and an MS, 1986 Civil Engineering, University California at Davis. He is a Registered Professional Civil Engineer, California, 1982. His experience includes 2 years - Chief, Water Resource Systems Division IWR-HEC, Leading the Division in the development and application of Flood Damage Reduction, Ecosystem Restoration, and System Analysis software. Project Manager for the Helmand Valley Water Management Plan for Afghanistan. Lead manager for data and modeling project for Iraq; 2 years - Regional Design Team Lead, USDA – NRCS, Serviced four states providing engineering leadership and guidance to a group of design engineers and technicians; 7 years - Chief, Hydraulics/Hydrology Section and Senior Hydraulic Engineer, NWS. Chief, Civil Design Section, SPK provided engineering supervision to a staff of 22 engineers and technicians; 1 year - HEC, Planning Analysis Division –Senior Hydraulic Engineer assisting in the development of the next generation of the HEC-FDA and HEC – FIA; 1 year – Chief, San Joaquin River Section, SPK responsible levee rehabilitation projects associated with the PL84-99 Levee

Rehabilitation Program; and 13 years – Hydraulic Engineer, SPK – Hydraulic modeling technical expert particularly with multi-dimensional applications.

5. Charge to Reviewers. A charge to project delivery team and reviewers was developed for this ATR. The charge statements were all generic statements and therefore are not included in this documentation. The ATRT Lead discussed the roles and responsibilities with ATRT members, identified the PDT, and the District POC. All of the team members had participated in similar reviews with the same ATRT Lead and all had participated in the ATR of the draft GRR and NEPA documents. The reviewers fully understood the roles and responsibilities. The ATRT Lead's electronic meeting notice to the ATRT provided the location and description of review documents, review schedule, labor codes, and labor amounts. The notice also identified the PDT and provided contact information, identified the ProjnetTM DrChecks project and reviews, and stated the requirement for four part comments. The notice provided numerous schedule and status updates during the ATR.

6. Summary. The project documentation was extensive, including over 2,000 pages of documentation between the main report (about 810 pages) and the EIS/EIR (about 1,210 pages). Six targeted ATR work product reviews were conducted. The draft GRR and draft EIS/EIR were reviewed between July 2014 and January 2015. The Final ATR had 86 comments received that were all closed, and ATR completed without issues or controversy.

The following paragraphs summarize the status of comments.

a. Critical. None. There were 6 Very High or High Significant comments that were discussed and resolved:

6230324 Cost Engineering
VERY HIGH
CONCERN: The 2015 PDT members attending the risk register update exclude Contracting, Construction and Geotechnical. Just 5 PDT members were included on a $1B project
RESOLVED: Additional meetings were held with additional PDT members present.

6230325 Cost Engineering
HIGH

CONCERN: Risk CO1 Differing Site Conditions - The risk register refers to the risk as Mods and Claims. The model and the sensitivity chart refers to the same risk as Differing Site Conditions.
RESOLVED: Risk register titles were revised.

6230327 Cost Engineering
VERY HIGH
CONCERN: Risk ET 1 Estimate Assumptions and Quantities - This risk appears to be the 2nd most variable risk and is a composition of estimate assumptions and quantities. Looking at the supporting documentation, the risk was actually modeled as quantity impacts only. Further, the variance values are the same as risk TL12 Design Development, suggesting a possible duplication or correlation. The actual estimate assumptions were not apparently modeled but could be assumptions related to contractor markups and assignments, construction methodology, crews and productivity, borrow sources and haul distances.
RESOLVED: Risk documents and categories have been revised.

6230342 Cost Engineering
VERY HIGH
CONCERN: Risk TL8 Vegetation Variance - When considering variance values, this should be the highest risk variable presented. Yet, since the probability assigns a 10%, the risk does not show up as a high risk on the sensitivity chart. Also I note that is modeled as a uniform distribution, suggesting the cost impacts are REALLY unknown.
RESOLVED: PDT reviewed issue and cost impacts and provided additional information from an existing project.

6230343 Cost Engineering
HIGH
CONCERN: Some low modeled risks actually show a higher variance and impact than certain moderate risks. Some moderate risks in the model suggest that they are actually low due to the small value.
RESOLVED: PDT provided clarification.

6230344 Cost Engineering
HIGH
CONCERN: Risk Model –The latest risk model is based on $942M and excludes real estate. But then the TPCS includes the same contingency % for Real Estate. I do not find a Real Estate report supporting the TPCS.
RESOLVED: PDT provided additional RE information and is reviewing RE contingency.

b. Unresolved. None.

c. Lessons Learned. None.

7. ProjnetTM DrChecks Report. The Projnet™ DrChecks report for the Final ATR is attached as Enclosure 1.

8. ATR Completion Statement. Enclosure 2 contains the completion statement of agency technical review.

Marc L. Masnor, P.E.
CESWF-PEC-PF (Tulsa, OK)

Enclosure 1

PROJNET™ DRCHECKS REPORT OF ALL COMMENTS

Comment Report: All Comments
Project: West Sacramento General Reevaluation Report (GRR) (incl ATR & DQC Reviews)(P2# 320653)
Review: ATR Final GRR (7-28 Aug 2015)
Displaying 86 comments for the criteria specified in this report.

Id	Discipline	Section/Figure	Page Number	Line Number
6197423	Risk Assessment	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Discussed updated report materials for the risk assessment/analysis with PDT member. PDT member responsible for executing the risk assessment and documenting the risk analysis stated that the applied procedure and the report language are essentially the same as in the previous version thus no further comments are provided here.

Submitted By: Michael Deering (5307561104). Submitted On: Aug 14 2015

1-0 Evaluation **Concurred**
Evaluation added by the ATRT Lead to allow closing of the "no comment" comment.

Submitted By: Marc Masnor (918-669-7349) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
Backcheck closed by the ATRT Lead for the "no comment" comment to allow closing of the backcheck.

Submitted By: Marc Masnor (918-669-7349) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6211169	Hydraulics	Study Approach	1-3	2nd Paragraph

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The firs sentence notes that the flood inundations are based on a single levee breach within a reach. At first reading this suggest that there is only one breach location evaluated.

BASIS FOR THE CONCERN: In a system this large there will be multiple breach locations that should be evaluated.

SIGNIFICANCE OF THE CONCERN: Low since I believe that the evaluation is correct and multiple locations were included to make sure that every interior area with potential life loss and damage potential was analyzed.

ACTION NEEDED TO RESOLVE THE CONCERN: Note if this has been described in other areas of the project documentation or expand on the discussion to validate that the flood inundations were developed to incorporate all the potential impacted areas.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

1-0 Evaluation **Concurred**

There were 8 reaches within the system. The text has been updated to include the following statement: "The West Sacramento Levee System was divided up into 8 reaches for this analysis." Additional information is also in Chapters 5 and 6.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015

Current Comment Status: **Comment Closed**

6211178 Hydraulics Model Calibration 3-1 1st paragraph

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The calibration results are noted as being "reasonably" reproduced". I'm not sure that this tells the reader that there is a high confidence in the modeling.

BASIS FOR THE CONCERN: Calibration of modeling is paramount to instill a level of confidence in the analysis results. Showing calibration results is a positive aspect and shows that a significant level of efffort has been expended to come up with a reasonable answer

SIGNIFICANCE OF THE CONCERN: Moderate. Level of effort conducted by H&H should be shown or noted.

ACTION NEEDED TO RESOLVE THE CONCERN: Recommend additional discussion be provided that will help to define the level of calibration. What is the actual differences in WS and Flow.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

1-0 Evaluation **Concurred**

The Technical Memorandum referenced in the paragraph contains much of this information. This hydraulic appendix was intended to be a streamlined to meet SMART Planning Principles. Additional information from the Tech Memo has been added to the hydraulic appendix.
The Calibration Technical Memorandum can be made available as well.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6211222	Hydraulics	Section 3.4 Water Surface Profiles	3-2	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: It was stated that all modeling was conducted with HEC-RAS.

BASIS FOR THE CONCERN: The results suggest that the modeling was conducted in unsteady mode, but unsteady runs are necessary to conduct the interior flooding component

SIGNIFICANCE OF THE CONCERN: Low - confirmation of work

ACTION NEEDED TO RESOLVE THE CONCERN: Verify that the HEC-RAS was conducted using the unsteady module.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

1-0 Evaluation **Concurred**
Yes, the hydraulic modeling conducted to develop the water surface profiles were based on HECRAS unsteady model runs with hydrographs.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6211233	Hydraulics	Section 3.5 Levee Breach Assumptions	3-3	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The first bullett notes 500 feet breach widths were used and suggested that 1,000 feet was referenced in other studies. These referenced values are good to know but were any sensistivity analyses conducted to deterimine if varied breach widths were highly sensitive to consequences?

BASIS FOR THE CONCERN: Using a 500 or 1,000 feet width just seems arbitrary unless there is some type of analysis noted to give confidence in the value

SIGNIFICANCE OF THE CONCERN: Moderate

ACTION NEEDED TO RESOLVE THE CONCERN: Note in the text if any analyses were conducted to help determine a reasonable breach width or if analyses were conducted to determine a range of widths that are sensitive to consequences.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

1-0 Evaluation **Concurred**

The last paragraph includes a reference to a Levee Breach Sensitivity Technical Memorandum where several sensitivity analyses were conducted to show that 500' was a reasonable estimate for breaks on the Sacramento River, Yolo Bypass and other major rivers in the system. This Technical Memo can also be provided to the reviewer. This hydraulic appendix was intended to be a streamlined to meet SMART Planning Principles.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015

Current Comment Status: **Comment Closed**

6211253	Hydraulics	Section 3.5 Levee Breach Assumptions	3-3	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The second bullet notes that the trigger for breach of the levees was set at 0.5 feet below the max water surface at the failure location. It was noted in the Section 6.10 text that all levees were assumed to hold and the only failure mode analyzed was overtopping. if this is the case, was using a depth of flooding over the top of the levee an option? Also, does the 0.5 ft below peak stage only work if the water surface is more than 0.5 feet over the top of the levee?

BASIS FOR THE CONCERN: Since sensitivity of the flood inundation was noted as volume then for a large flood the failure could occur earlier for depth over the levee than 0.5 ft before the max stage. timing could affect the inundation outcome and consequences.

SIGNIFICANCE OF THE CONCERN: Moderate

ACTION NEEDED TO RESOLVE THE CONCERN: REcommend additional discussion on development of the trigger elevation assumption and include why this assumption fits this project.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

Revised Aug 25 2015.

1-0 Evaluation **Concurred**

More discussion of levee breach sensitivity is included in section 5.2 of the hydraulic appendix. The use of the 0.5' target below the max water surface elevation was to ensure a levee break occurred during that flood event so that a floodplain could be generated for use in HECFDA. This ensures a 100% of failure and the combination of probabilities for H&H and Geotech was left to be evaluated in HECFDA. It was not intended to reflect what might actually happen in terms of a timing of a levee break. In terms of timing, if the break occurs well after the peak then the volume of water reaching the basin is significantly reduced. While this may happen, the study was trying to have a consistent set of floodplains through suite of n-year events and at each index point.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015

Current Comment Status: **Comment Closed**

6211269	Hydraulics	4.2 Alternative 1: Improve Levees in Place	4-2	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The alternative 1 description does not specifically address raising levees.

BASIS FOR THE CONCERN: Protection from overtopping is noted but I think it should be more pronounced that this includes a levee raise

SIGNIFICANCE OF THE CONCERN: Low

ACTION NEEDED TO RESOLVE THE CONCERN: Recommend additional discussion in the paragraph to show that the intent is to raise the level various levels with an expected maximum of about 2 feet.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

1-0 Evaluation **Concurred**

There has been significant concern about levee raising on this project due to policy concerns. Also, with such a limited height raise, it was not clear if this limited raise is a separate increment or part of overall levee repair. Text edits have been made to help clarify.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6211279	Hydraulics	4.3 Alternative 2: Improve Levees in Place and Widen Sacramento ByPass	4-3	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The description of the alternative includes impacts to the Sacramento River but there is no discussion about impacts to the Yolo Bypass due to the added volume, peak flow and duration of flow.

BASIS FOR THE CONCERN: ARe there detrimental effects downstream due to the diversion of flow along the Yolo Bypass

SIGNIFICANCE OF THE CONCERN: Low

ACTION NEEDED TO RESOLVE THE CONCERN: Recommend additional discussion on the impact, if any, to the Yolo Bypass. Include model results.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

1-0 Evaluation **Concurred**
Additional Information has been added to Section 4.3 with a new section 4.3.1 on Yolo Bypass Impacts. This information was taken from the American River Common Features GRR as the Sac Bypass Widening is part of the Recommended Plan for the American River Common Features GRR.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6211307	Hydraulics	5.1 FLO-2D Model Development	5-1	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The 5th bullet states that no rainfall on the interior was modeled. Generally, excessive rainfall causing high water in the river could also cause local flooding. Can the existing pumping system keep up with local rainfall prior to levee failure from the river side?

BASIS FOR THE CONCERN: The added volume from interior rain could increase flood levels.

SIGNIFICANCE OF THE CONCERN: Moderate

ACTION NEEDED TO RESOLVE THE CONCERN: Provide additional discussion on the residual flooding component. Include how this component can be eliminated

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 25 2015

1-0 Evaluation **Concurred**

An interior drainage analysis was also conducted and is summarized in Section 7.4. From the analysis, the interior drainage had little residual risk and adequately kept up with rainfall events up to the 200-yr event. The pumps are already built to pump water over the levee system.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015

Current Comment Status: **Comment Closed**

6211789	Hydraulics	5.1 FLO-2D Model Development	5-2	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: I'm not clear on the assumption of failure of the soundwalls. I understand that the structural integrity may not be adequate and that is a legitimate concern. I am not sure I understand how the road embankment eliminates the need for the soundwall. Is the roadway the actual barrier?

BASIS FOR THE CONCERN: Generally, soundwalls can redirect flood waters and provide some level of protection so it would be good to have these in the model. if the roadway is the more prominate barrier then that would probably be fine.

SIGNIFICANCE OF THE CONCERN: Low

ACTION NEEDED TO RESOLVE THE CONCERN: I think that after looking at this in more detail I see that the intent is to use the roadway as the barrier and then there is no need to special model the soundwall. This isn't necessarily clear at first read so I suggest a little more detail to make sure this is understood clearly and easily as i think this is any important part of the interior modeling.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 26 2015

1-0 Evaluation **Concurred**
Text was added to the assumption to clarify that the raised roadway embankment is acting as the barrier.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6211808 Hydraulics 6 Risk Analysis 6-1 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: The last paragraph in section 6 discusses several pertinent studies in the Sacramento area. These studies were conducted by contractors and relate to development of process and parameters to support development of Risk values for this complicated system. These are good references but its not clear as to what was actually taken from these studies and how it impacts this part of the study.

BASIS FOR THE CONCERN: There is little doubt that the information obtained is likely pertinent but there is no reference to exactly what data was taken from the studies or how it was used.

SIGNIFICANCE OF THE CONCERN: Moderate

ACTION NEEDED TO RESOLVE THE CONCERN: Recommend more detail about the studies and what specific information was used from these to enhance this study phase.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 26 2015

1-0 Evaluation **Concurred**
Text was added to clarify what information was used from the studies. HEC developed HECFDA models for the Sacramento River System along with uncertainty values and this information was update slightly by the local sponsor (SAFCA) and their consultants.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6211825 Hydraulics 7.1 Superiority 7-1 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: West Sac Hyd Appendix Reformatted 11Aug2015Maak)

REVIEW CONCERN: Utilizing the Sacramento Weir as flood relief along the Sacramento River is good up to the design level storm. Levee Superiority applies to events greater than the design storm. I don't feel that there has been enough information presented to show what will happen if the design event is exceeded.

BASIS FOR THE CONCERN: Larger events should be analyzed to show at what levels the Sacramento Weir can provide relief and what conditions exist that may still cause levee overtopping.

SIGNIFICANCE OF THE CONCERN: Moderate

ACTION NEEDED TO RESOLVE THE CONCERN: Recommend analyses to analyze the operation of the Sacramento Weir for a larger than design storm and describe how this protects the levee system from greater events. Also, consider what conditions could exist that would cause first overtopping.

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 26 2015

1-0 Evaluation **Concurred**

This text of this section has been significantly updated to include much more discussion on superiority and residual risk. The 0.2% (1/500) ACE event was modeled. The overtopping during events greater than a 0.5% (1/200) are limited because much of the extra water in the American River goes out of the channel upstream of the American River Levees and into the American River North and South Basins. The other threat is from the Sacramento River System where the Bypasses serve as a buffer and many of the upstream levees are not built to contain a 0.2% (1/500) ACE event and will likely overtop the levees upstream also limiting the amount of water that can get to the West Sac Levees. Inside the basin, the levee that is likely to be overtopped first is backfilled to the top of levee and even a bit higher. The overopping flows here would not cascade down but gently flow into an industrial area and then likely into the Sacramento Deep Water Ship Channel which also serves as a natural drain.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015

Current Comment Status: **Comment Closed**

6211992	Hydraulics	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

No Comment. All Hydraulic comments were based on review of the H&H Appendix entitled:

"WestSac_HYD_APPENDIX_Reformatted_11Aug2015Maak.docx"

Submitted By: Russell Wyckoff (918-669-7107). Submitted On: Aug 26 2015

1-0 Evaluation **Concurred**
Thanks for the clarification.

Submitted By: Jesse Schlunegger (916-557-6777) Submitted On: Sep 05 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Russell Wyckoff (918-669-7107) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6213695 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

1. CONCERN: Observation: Some of the comments are based my observation of cost and schedule documents that are in conformance with the cost and schedule requirements. The purpose of these comments is to record the aspects of the cost and schedule documents that have been considered in the review. Your evaluation can be: concur. An evaluation is required in order for the reviewer to close the comment.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213696 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

2. CONCERN: ATR completion could be significantly delayed if additional rounds of backchecks and evaluations are required to get the clarification included in the documents.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: In the comment evaluations, please provide a detailed explanation of what has been changed to the cost and schedule documents in response to the comment, including the location of the change. Explain why the comment does not require a change to the documents if no change is made. Address each statement or concern in the comment. In most cases, the comment is intended clarify a concern and the clarification must be included in the documents, not just in the evaluation. This will help to expedite the backcheck process in order to close comments as soon as possible.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213697 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

3. CONCERN: I am concerned about the estimate capturing all the project scope since the cost has changed significantly since the last set of documents was provided.

Direct Cost Sub CMU Cost To Prime Prime CMU Contract Cost

2015 02 02 798,672,922 210,635,910 947,537,158 291,506,964 1,300,815,796

2015 08 12 688,662,868 129,497,585 556,915,490 171,333,380 989,493,832

The direct cost has changed (110,010,055) or -13.77%.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302

Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please provide a short description in the evaluation to document the apparent scope change.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

The apparent scope is one of actually many. At the time of prior submission, the major folder levee for the Sacramento River South – FIP was still being carried in the estimate due to the ADM not being completed. The ADM has been performed and those items not selected have been removed from the estimate. The MII file also has been cleaned up of all folders that were previously struck-thru, at least the appropriate ones have, as well as other clean up so that only the most current scope assumptions remain. At the previous submittal, only the top level folders were designated as Prime, and all subordinate folders where SUBCONTRACT. This has now been changed to what would reasonably be assumed would be the Prime/Subcontract relationships for the entire estimate by reach. Real estate had some big swings in cost as well as environmental. Both are still in motion and will be updated again prior to submission of TPCS. As a note, these costs generally are not carried in the MII estimate, however, they are now included in the MII and carried forward to the TPCS. Labor and equipment has been repriced to current levels.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213698 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

4. CONCERN: I am concerned about the estimate capturing all the project scope since The following features of work have been deleted from the estimate. Their direct costs are indicated here.

4.1. 11 --- DWSC East Station 115+00 to171+71 Length = 4,825 = 0.91mi 15,859,513
4.1.1. 11.1 01 Real Estate 4,952,000
4.1.2. 11.2 02 Relocation 2,755,441
4.1.3. 11.3 06 Fish & Wildlife Facilities 2,730,000
4.1.4. 11.4 11 Levee & Floodwalls 5,422,073

4.2. 14 Sac River - South Levee - FIP 189,109,521
4.2.1. 14.2 Relocations 28,374,853

4.2.2. 14.3 Environmental 4,305,000
4.2.3. 14.4 Levees and Floodwalls 156,429,668

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please provide a short description in the evaluation to document the apparent scope change.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

The MII file previously submitted was created in such a manner as to be able to price all alternatives in one MII file as apposed to several files.

DWSC East 115+00 to 171+71 is now combined with DWSC East 0+00 to 115+00 to create the new DWSC East 0+00 to 171+71.

Since the Sac River-South Levee - FIP was not carried forward and the Sac River-South set back Levee was, this reach has been removed from the MII estimate file.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213699 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

5. CONCERN: I am concerned about the estimate capturing all the project scope since The following features of work have been added to the estimate. Their direct costs are indicated here.

5.1. 2 Yolo Bypass
5.1.1. 2.1 Yolo Bypass Levee (North) Sta. 136+00 to 155+00 = 1,900 lf = .36 mi 6,428,996
5.2. 2.2 Yolo Bypass Levee (South) Sta 0+00 to 64+60 = 6460 lf = 1.22 mi
5.2.1. 2.2.1 01 Real Estate 175,500
5.3. 3 Lock Closure Levee
5.3.1. 3.1 01 Real Estate 1,300,000
5.3.2. 3.3 11 Levees and Floodwalls 13,095,524
5.4. 4 DWSC West Station 0+00 to123+00 Length = 12,300' = 2.33 mi

5.4.1. 4.1 01 Real Estate 1,409,365

5.5. 5 DWSC West Levee (Navigation Levee) 123+00 - 1002+60 = 87,960 lf = 16.7 mi
5.5.1. 5.1 01 Real Estate 3,509,375
5.6. 6 South Cross Levee Station 0+00 to 62+73 Length = 6,273' = 1.19mi
5.6.1. 6.1 01 Real Estate 8,990,000
5.7. 7 Port North Levee
5.7.1. 7.1 01 Relocation Inventory & Costs from RE 6,400,000
5.8. 8 Port South Levee
5.8.1. 8.1 01 Relocation Inventory & Costs from RE 5,100,000
5.9. 9 DWSC East Station 0+00 to171+71 Length = 17,171' = 3.25mi
5.9.1. 9.1 01 Real Estate 13,000,000
5.10. 10 Sac River - North Levee
5.10.1. 10.1 01 Real Estate Relocation Assistance 52,552,500

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please provide a short description in the evaluation to document the cost change.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

5.1. 2 Yolo Bypass
5.1.1. 2.1 Yolo Bypass Levee (North) Sta. 136+00 to 155+00 = 1,900 lf = .36 mi
6,428,996 This reach was not included in the alternative selection process. Being left out did NOT affect the selection process because it would have been in ALL of the alternatives.
5.2. 2.2 Yolo Bypass Levee (South) Sta 0+00 to 64+60 = 6460 lf = 1.22 mi
5.2.1. 2.2.1 01 Real Estate 175,500 MII not normally include Real Estate (RE) and account for these costs in the TPCS. Real Estate updated their numbers. 3 Lock Closure Levee
5.2.2. 3.1 01 Real Estate 1,300,000 Updated RE costs.
5.2.3. 3.3 11 Levees and Floodwalls 13,095,524 This is not a new item or reach. The name has changed slightly from that time.
5.3. 4 DWSC West Station 0+00 to123+00 Length = 12,300' = 2.33 mi
5.3.1. 4.1 01 Real Estate 1,409,365 Real Estate updated their numbers.
5.4. 5 DWSC West Levee (Navigation Levee) 123+00 - 1002+60 = 87,960 lf = 16.7 mi
5.4.1. 5.1 01 Real Estate 3,509,375 MII not normally include Real Estate (RE) and account for these costs in the TPCS. Real Estate updated their numbers.
5.5. 6 South Cross Levee Station 0+00 to 62+73 Length = 6,273' = 1.19mi
5.5.1. 6.1 01 Real Estate 8,990,000 MII not normally include Real Estate (RE) and account for these costs in the TPCS. Real Estate updated their numbers.
5.5.2.
5.6. 7 Port North Levee
5.6.1. 7.1 01 Relocation Inventory & Costs from RE 6,400,000 MII not normally include

Real Estate (RE) and account for these costs in the TPCS. Real Estate updated their numbers.
5.7. 8 Port South Levee
5.7.1. 8.1 01 Relocation Inventory & Costs from RE 5,100,000 MII not normally include Real Estate (RE) and account for these costs in the TPCS. Real Estate updated their numbers.
5.8. 9 DWSC East Station 0+00 to171+71 Length = 17,171' = 3.25mi
9.1 01 Real Estate 13,000,000 MII not normally include Real Estate (RE) and account for these costs in the TPCS. Real Estate updated their numbers. . This reach was previously estimated as two separate folder reaches and has since been combined into one when the selected plan was determined.
5.9. 10 Sac River - North Levee
10.1 01 Real Estate Relocation Assistance 52,552,500 MII not normally include Real Estate (RE) and account for these costs in the TPCS. Real Estate updated their numbers.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213700 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

6. CONCERN: At the detail level, some costs have decreased and some have increased. Cost changes are due to quantity changes because of added or deleted features noted above, and due to unit price changes. The following detail items have unit price that changed significantly. The actual list is much longer. The unit cost change is significant but in most cases the impact to the total estimated amount is not significant.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Low

RESOLUTION: Please provide a short description in the evaluation to document the unit cost change. General statements are sufficient.

Date 01/29/16 08/12/16

title only from 2015 01 29 DUC DUC Units DUC Change %

Haul of Material to Waste 64.51 2,132 TON 3205.4%

Wood Power Pole Relocation 30,000 94,651 EA 215.5%

10.5'-14' Wide Footing Compaction (160+00 - 1 0.11 0.26 SF 140.1%

Remove Silt Fence by hand and repair area 1.06 0.11 LF 89.8%

Grade setter / checker 40.67 76.70 HR 88.6%

20K Gallon Baker Tank 8.21 1.02 HR 87.6%

Storm Drain Inlet Protection 58.60 8.08 EA 86.2%

Laborers, (Semi-Skilled) 50.86 9.57 HR 81.2%

Saw Cutting Existing AC Paving (to 4" deep) 4.06 0.92 LF 77.3%

Place Traffic Signs (eg Stop Sign) 280.48 75.75 EA 73.0%

ABC, placement 22.10 6.35 TON 71.3%

Electrical Utility Poles, wood poles material handli 438.91 127.12 EA 71.0%

ABC, purchase and placement 24.05 6.99 TON 70.9%

DUC = Direct Unit Cost

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

Haul of Material to Waste 64.51 2,132 TON 3205.4% Three of the instances occurred in the Sac River South FIP and this "reach" is not being built and is now an omitted folder. The remaining instance is reasonable.

Wood Power Pole Relocation 30,000 94,651 EA 215.5%
Changed to 30k so that consistent with other projects of similar scope
10.5'-14' Wide Footing Compaction (160+00 - 1 0.11 0.26 SF 140.1%
Working conditions are limit access/movement area, so production was changed to a one day minimum

Remove Silt Fence by hand and repair area 1.06 0.11 LF 89.8% Crew has been updated.

Grade setter / checker 40.67 76.70 HR 88.6%
Adjusted to current labor rates.

20K Gallon Baker Tank 8.21 1.02 HR 87.6% Items changed from Stand By to Average

Storm Drain Inlet Protection 58.60 8.08 EA 86.2% Crew makeup changed

Laborers, (Semi-Skilled) 50.86 9.57 HR 81.2%

% Reviewed crews and adjusted as required.
Saw Cutting Existing AC Paving (to 4" deep) 4.06 0.92 LF 77.3% Reviewed crews and adjusted as required.

Place Traffic Signs (eg Stop Sign) 280.48 75.75 EA 73.0% Reviewed crews and adjusted as required.

ABC, placement 22.10 6.35 TON 71.3% Reviewed estimate to make sure that all elements are in current estimate. Some items did not have the material in them for some reason, the most consistent common between items was the fact that the the description included "Purchase" but did not actually include it. Estimate confirmed to include all needed tasks.

Electrical Utility Poles, wood poles material handli 438.91 127.12 EA 71.0% Could not find this item in estimate.

ABC, purchase and placement 24.05 6.99 TON 70.9% Reviewed estimate to make sure that all elements are in current estimate. Some items did not have the material in them for some reason, the most consistent common between items was the fact that the the description included "Purchase" but did not actually include it. Estimate confirmed to include all needed tasks.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213701 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

7. OBSERVATION: Estimate Structure

1610 Notes

606 Unique Notes

2355 detail

491 upper folder

937 lower folder

5393 Lines of Data

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213702 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

8. OBSERVATION: Direct Construction Cost Summary

97,614,136 22.4% Direct Construction Labor $97,614,136, 22.41% of Direct Construction Cost

130,971,135 30.1% Direct Construction Equipment $130,971,135, 30.07% of Direct Construction Cost

228,585,272 52.5% Direct Construction Labor + Equipment $228,585,272, 52.48% of Direct Construction Cost

127,001,900 29.2% Direct Construction Matl $127,001,900, 29.16% of Direct Construction Cost

28,993,216 6.7% Direct Construction Sub Bid $28,993,216, 6.66% of Direct Construction Cost

50,967,270 11.7% Direct Construction User $50,967,270, 11.7% of Direct Construction Cost

435,547,658 100% Direct Construction Cost

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213703 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

9. OBSERVATION: Direct Cost Overrides

$ % of Labor, Equip, Material % of Total Direct Construction

M 34 19,014,613 14.97% 4% 34 MATERIAL Overrides, $19,014,613, 14.97% of Direct Construction Matl, 4.37% of Direct Construction Cost

N 2118 313,048,380 72% 2118 NO Overrides, $313,048,380, 71.87% of Direct Construction Cost

E 25 526,167 0.40% 0.12% 25 EQUIPMENT Overrides, $526,167, 0.4% of Direct Construction Equipment, 0.12% of Direct Construction Cost

O 101 88,115,052 20.23% 101 OUTPUT Overrides, $88,115,052, 20.23% of Direct Construction Cost

L 12 274,592 0.28% 0.06% 12 LABOR Overrides, $274,592, 0.28% of Direct Construction Labor, 0.06% of Direct Construction Cost

Sb 55 11,093,050 2.55% 55 SUB BID Overrides, $11,093,050, 2.55% of Direct Construction Cost

Total 227 119,023,475 27.33% 227 TOTAL Overrides, $119,023,475, 27.33% of Direct Construction Cost

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213704 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

10. CONCERN: The following item reference ProdQuant WORKSHEETS.xls

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please provide the referenced file "ProdQuant WORKSHEETS.xls"

10.1. detail Random Levee Material Placement, Shaping, and Compaction, Sheepsfoot , 1,417,647 ECY @ $8.61 per ECY = $12,206,936, 5% of the estimated direct Labor and Equipment Construction Cost, 3% of the estimated total direct construction cost, used 2 times in the estimate, overrides = 0

Cost supported by the following note: (Note: for Production Rate (Crew Output), see ProdQuant WORKSHEETS.xls - Task considers placement, shaping, and compaction of levee material. Crew output based on average material placed at ~300 LCY/HR. Material when compacted, ECY, is estimated to

10.2. detail Delivery of Levee Material from Borrow Site , 1,850,829 LCY @ $14.97 per LCY = $27,709,727, 12% of the estimated direct Labor and Equipment Construction Cost, 6% of the estimated total direct construction cost, used 3 times in the estimate, overrides = 0

Crew and Production Rate development supported by the following note "for Haul Rate (Crew Output), see ProdQuant WORKSHEETS.xls - **Quantity to be calculated by taking volume takeoff, ECY, multiplied by swell factor for ECY to LCY, 1.4,. **Using trucks with a capacity of 24CY, considering a 90% average loading factor, accounting for loading, 20 mi haul, dump, and return trucks should cycle at 1.7 HRS/Load. This equates to ~300 LCY/HR. Material loaded and hauled is determined to be LCY, use appropriate material swell and shrink factors when calculating volume. Change material cost to specific material."

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

10.1: Spreadsheet notes added to notes in estimate.

10.2: Spreadsheet notes added to notes in estimate.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213705 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

11. CONCERN: Crew and Production Rate development are not supported by notes that I could find.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please include notes to document the crew and production rate development. If crew and production rate development are documented in "ProdQuant WORKSHEETS.xls", Please provide file "ProdQuant WORKSHEETS.xls".

11.1. detail Barge Travel Time, 4 Barge Group, Round Trip , 2,908 HR @ $2,656.44 per HR = $7,725,576, 3% of the estimated direct Labor and Equipment Construction Cost, 2% of the estimated total direct construction cost, used 2 times in the estimate, overrides = 0

11.2. detail Articulated Haul Truck (36 tn load) , 109,751 HR @ $204.68 per HR = $22,464,358, 10% of the estimated direct Labor and Equipment Construction Cost, 5% of the estimated total direct construction cost, used 1 times in the estimate, overrides = 0

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

11.1: Spreadsheet notes added MII notes.

11.2: Haul assumption notes adde dto haul folder level.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213706 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

12. OBSERVATION: detail Double Bottom Dump , 131,956 HR @ $125.24 per HR = $16,526,447, 7% of the estimated direct Labor and Equipment Construction Cost, 4% of the estimated total direct construction cost, used 35 times in the estimate, overrides = 0

Crew and Production Rate development supported by the following note: Load: 6 minutes

Fill site to Job site: 3.2 miles x hr / 15 miles
+ 35 miles x hr / 55 miles
+ 4.9 miles x hr / 35 miles = 59 minutes
Scales 5 minutes
Dump: 6 minutes
Return 59 minutes
135 minutes / round = 2.25 hrs/rnd = 2.25 hrs/load
RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213707 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

13. OBSERVATIION: detail Slurry Wall Placement, DSM Method , 4,900 HR @ $2,475.73 per HR = $12,131,081, 5% of the estimated direct Labor and Equipment Construction Cost, 3% of the estimated total direct construction cost, used 4 times in the estimate, overrides = 0

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Costs are supported by the following note:

DeepSoilMixing (DSM) STA 155+00 to 194+50
assumes 4 shaft auger rig with shafts at 2 ft OC
DeepSoilMixing (DSM) (NOTE: effective width of panel is expected to be 7 ft)
Cutoff Wall Production, SCB Wall, DSM, more than 80 ft deep
DeepSoilMixing (DSM)
Production Hour (Need a Separate Data Calc. for every change in Wall Depth and Overhead Power Site)
Length of Wall 3,950 LF Total Area 452,275 SF

Depth of Wall 114.5 FT Total Working Panel Wall Area 581,202 SF
Width of Wall 3 FT %Soil 100 %
Number of Wall Panals 564 EA %Rock 0 %
Setup time per Wall Panal 0.5 HRS Soil Down Cycle 1.00 Ft/min
Number of Pipes 0 EA Rock Down Cycle 1.00 Inch/min
Setup time per Pipes 8 HRS Up Cycle 1.25 Ft/min

Increase Hour Factor 1 FCTR Production Rate 300 SF/HR
Normal work 1, Under Powerlines 1.55 Subtotal Hours 1937.34 HRS
Total Width of each Panel 9.00 LF Wall Panels and Pipe Set Up Time (+) 282 HRS
Overlap between Panel 2.00 LF Subtotal Hours (=) 2219.34 HRS
Daily Setup Time 0.17 HRS/DAY Total Daily Setup Time 32.98 HRS
Hours Work 10 HRS Subtotal Hours 2252.32 HRS
Roundup to the nears 1,2,4,8 hrs 10 HRS Total hours Req'd 2,260 HRS
End
Slurrywall Mixture Quantities
Width of Wall 3 FT
Waste Factor 1.05 FCTR
Soil Weight 3500 lb/cy
Soil Weight for Mix 3286 lb/cy
3.5 % Bentonite Mix
Bentonite 122.5 #/CY Bentonite Req'd 3,900 TONS
80 #/BAG
3 % Cement Mix
Cement 105 #/CY Cement Req'd 3,343 TONS
94 #/BAG
Water 25 GAL/CY Gal of Water Req'd 1,695,173 GAL
End

This is specialized construction. If cutoff wall construction is the major work, this job will be bid by a Prime Contractor. If cutoff wall construction is mixed in with other construction work, the cutoff wall construction will be subcontracted out, and the cost should include mob and demob.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213708 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

14. OBSERVATION: The following detail items include notes to document crew and production rate development.

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

14.1. detail Push boat / Tug Crew , 18,348 HR @ $550.85 per HR = $10,106,968, 4% of the

estimated direct Labor and Equipment Construction Cost, 2% of the estimated total direct construction cost, used 1 times in the estimate, overrides = 0

14.2. detail Borrow Site Site Loading , 1,877,236 LCY @ $4.39 per LCY = $8,237,610, 4% of the estimated direct Labor and Equipment Construction Cost, 2% of the estimated total direct

14.3. detail Base Drill Rig , 9,864 HR @ $608. per HR = $5,997,312, 3% of the estimated direct Labor and Equipment Construction Cost, 1% of the estimated total direct construction cost, used 7 times in the estimate, overrides = 0

14.4. detail Scraper, Open Bowl, 32-44 cy, Cat 657E w/ Operator , 10,472 HR @ $586.59 per HR = $6,142,822, 3% of the estimated direct Labor and Equipment Construction Cost, 1% of the estimated total direct construction cost, used 6 times in the estimate, overrides = 0

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213709 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

15. CONCERN: Significant Material Cost. Riprap costs. 71,629,007 16% of the total direct cost. Note documenting material cost are lacking or incomplete (source contact information, date, amount, conditions (delivery included, tax included, loading or unloading included). One note provides a date : " (Note: per Teichert Aggregate & Asphalt Pricing (FY 04/01/12-03/31/13) (Cool Cave Quarry))" indicating that the cost is over 2 years old.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please get recent quotes and document in the notes with source contact information, date, amount, conditions (delivery included, tax included, loading or unloading included).

15.1. detail Riprap , 2,179,314 TON @ $26.25 per TON = $57,208,352, 45% of the estimated direct Material Construction Cost, 13% of the estimated total Direct Construction Cost, used 6

times in the estimate, overrides = 0

15.2. detail Rip Rap , 463,718 TON @ $21.65 per TON = $10,039,495, 8% of the estimated direct Material Construction Cost, 2% of the estimated total Direct Construction Cost, used 2 times in the estimate, overrides = 0

15.3. detail 10"-23" Rip Rap , 85,574 TON @ $21.33 per TON = $1,824,887, 1% of the estimated direct Material Construction Cost, 0% of the estimated total Direct Construction Cost, used 2 times in the estimate, overrides = 0

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

15.1: Unit price has been adjusted to current quote

15.2: Unit price has been adjusted to current quote

15.3: Item no longer used in estimate. Replaced with landside placement rock

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213710 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

16. CONCERN: Significant Material Cost. detail Borrow Site Site Loading , 1,877,236 LCY @ $8.59 per LCY = $16,124,473, 13% of the estimated direct Material Construction Cost, 4% of the estimated total Direct Construction Cost, used 11 times in the estimate, overrides = 0

There are 11 instances of this item but only one includes any cost for material. 11.4.9.1 Borrow Site Site Loading 1,489,559 LCY $16,124,473

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please verify it is intended that only one instance have material costs and obtain a quote or other documentation to support the material price. Quote to include source contact information, date, amount, conditions (delivery included, tax included, loading or unloading included).

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

The one instance mentioned is a value created by the AE for the City of Sacramento for a borrow area indentified very close to the SRSouth reach and is located within a couple miles of project. The price for this is reasonable. Instances where material costs were added to the estimate as these items were missing the cost of the material. The remaining instances relate to the same excavation crew being used for mixing the cement/bentonite/soil mixture for placement back into the slurry ditch. It is reasonable that no purchase costs are included

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213711 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

17. CONCERN: Significant Material Cost. detail Cement , 45,722 TON @ $195.66 per TON = $8,946,034, 7% of the estimated direct Material Construction Cost, 2% of the estimated total Direct Construction Cost, used 15 times in the estimate, overrides = 0

Some of the instances include the following note: "(Note: take from Contractor pricelist 10/2012) ". This pricing may not be current.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: For this significant cost I suggest that a material quote be obtained. Quote to include source contact information, date, amount, conditions (delivery included, tax included, loading or unloading included).

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

Material costs in estimate have been changed to be consistent with other current projects. Trucking costs have also been added to reflect reasonable haul costs. Material cost updated, haul cost updated. Subbid used for haul from WY to project site Offload is with onsite fork lift.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213712 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

18. CONCERN: Significant Material Cost. detail Bentonite, 1ton bag , 43,527 TON @ $190.29 per TON = $8,282,834, 7% of the estimated direct Material Construction Cost, 2% of the estimated total Direct Construction Cost, used 16 times in the estimate, overrides = 0

Some of the instances include the following note: "(Note: taken from Contractor pricelist 10/2012). This pricing may not be current.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: For this significant cost I suggest that a material quote be obtained. Quote to include source contact information, date, amount, conditions (delivery included, tax included, loading or unloading included).

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
Material cost updated, haul cost updated. Subbid used for haul from WY to project site Offload is with onsite fork lift.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213713 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

19. OBSERVATION: Less significant detail material direct costs: The following is a list of the moat expensive but less significant material cost. They appear to be reasonable.

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

19.1. detail Fill Materiall - Embankment , 562,295 TON @ $7.59 per TON = $4,266,380, 3% of the estimated direct Material Construction Cost, 1% of the estimated total Direct Construction Cost, used 10 times in the estimate, overrides = 0

19.2. detail 3/4" Cl 2 AB , 204,228 TON @ $13.67 per TON = $2,791,212, 2% of the estimated direct Material Construction Cost, 1% of the estimated total Direct Construction Cost, used 11 times in the estimate, overrides = 0

19.3. detail 3/4" OGM - Asphalt , 42,723 TON @ $57.37 per TON = $2,451,125, 2% of the estimated direct Material Construction Cost, 1% of the estimated total Direct Construction Cost, used 3 times in the estimate, overrides = 0

19.4. detail Bentonite , 13,771 TON @ $177.53 per TON = $2,444,766, 2% of the estimated direct Material Construction Cost, 1% of the estimated total Direct Construction Cost, used 3 times in the estimate, overrides = 0

19.5. detail Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed , 4,675,440 SY @ $.43 per SY = $2,024,466, 2% of the estimated direct Material Construction Cost, 0% of the estimated total Direct Construction Cost, used 2 times in the estimate, overrides = 0

19.6. detail AZ-26 Sheet Pile - Matl. Cost - Temp. Sheet Pile Assume Using New/Salvage - , 2,389,019 LB @ $.81 per LB = $1,939,584, 2% of the estimated direct Material Construction Cost, 0% of the estimated total Direct Construction Cost, used 1 times in the estimate, overrides = 0

19.7. detail 48" Concrete Pipe - Class 3 , 12,700 LF @ $121.24 per LF = $1,539,748, 1% of the estimated direct Material Construction Cost, 0% of the estimated total Direct Construction Cost, used 1 times in the estimate, overrides = 0

19.8. detail Buy fill material , 299,036 CY @ $3.52 per CY = $1,052,046, 1% of the estimated direct Material Construction Cost, 0% of the estimated total Direct Construction Cost, used 3 times in the estimate, overrides = 1

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Observation comment closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213714	Cost Engineering	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

20. OBSERVATION: Direct Construction Sub Bid $28,993,216, 6.66% of Direct Construction Cost. The following Direct Construction Sub Bid are less significant each on their own and appear to be reasonable.

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213717 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

21. OBSERVATION: Significant Direct User Costs: detail Mobilization and Demobilization , 5 LS @ $3,469,005.6 per LS = $17,345,028, 34% of the estimated direct User Construction Cost, 4% of the estimated total Direct Construction Cost, used 5 times in the estimate, overrides = 0

Costs are supported by the following notes:
(Note: = 5% of Direct cost of this contract)
(Note: = 7% of Direct cost of this contract)
(Note: = 10% of Direct cost of this contract)

RESOLUTION: Observation Comment. No Resolution Required. Please agree or disagree.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Observation Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6213718 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

22. CONCERN: Significant Direct User Costs: detail Real Estate Relocations , 1 EA @ $6,382,116. per EA = $6,382,116, 13% of the estimated direct User Construction Cost, 1% of the estimated total Direct Construction Cost, used 1 times in the estimate, overrides = 0

Parent folder title reads "Relocation Inventory & Costs from RE". This may be only 1% of the direct construction cost but I can't tell what it is for

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please add a not indicating this is for.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

This item consists of the following items based on Real Estate information: 30" storm drain siphon, Main pump station lines (2-30", 1-42"), 48" steel line, 8" pipe line, 8" pipeline, 20" pipeline.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213719 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

23. CONCERN Wage Rates: There is a significant wage difference for truck drivers that could be understating the costs as much as $4 million.

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please consider the items discussed below and revise the lower rate drivers to match the upper rate drivers.

23.1. There are 6 different truck drivers at Base + Fringe = about 53.54/hr totaling 561,451 hours,

$36,416,384

Journeyman - 1.3.2.1 Truck Drivers, Heavy , max = $53.54 per hour, min = $53.54 per hour, % difference = 0%, occurs 63 times in the estimate, accounting for 1.35% of the total labor cost

Journeyman - 1.3.1.1 Outside Truck Drivers, Heavy , max = $53.54 per hour, min = $53.54 per hour, % difference = 0%, occurs 90 times in the estimate, accounting for 25.6% of the total labor cost

Journeyman - 1.3.2.3 Truck Drivers, Medium , max = $52.84 per hour, min = $52.84 per hour, % difference = 0%, occurs 17 times in the estimate, accounting for 0.26% of the total labor cost

Journeyman - 1.3.1.3 Outside Truck Drivers, Medium , max = $52.84 per hour, min = $52.84 per hour, % difference = 0%, occurs 120 times in the estimate, accounting for 9.55% of the total labor cost

Journeyman - 1.3.1.2 Outside Truck Drivers, Light , max = $52.54 per hour, min = $52.54 per hour, % difference = 0%, occurs 3 times in the estimate, accounting for 0.02% of the total labor cost

Journeyman - 1.3.2.2 Truck Drivers, Light , max = $52.54 per hour, min = $52.54 per hour, % difference = 0%, occurs 6 times in the estimate, accounting for 0.41% of the total labor cost

23.2. There are 5 different truck drivers at Base + Fringe = about $36 to $25 per hour totaling 66,783 hrs, $2,219,930.

Journeyman - 4.2 Private Truck Driver 1 (Bttm's) , max = $38.27 per hour, min = $38.27 per hour, % difference = 0%, occurs 7 times in the estimate, accounting for 0.47% of the total labor cost

Journeyman - 4.3 Private Truck Driver 4 (Transfer) , max = $37.01 per hour, min = $37.01 per hour, % difference = 0%, occurs 1 times in the estimate, accounting for 0.01% of the total labor cost

Journeyman - 4.1 Private Truck Driver 2 (Semi end) , max = $36.44 per hour, min = $36.44 per hour, % difference = 0%, occurs 5 times in the estimate, accounting for 0.01% of the total labor cost

Journeyman - 3.1.2 Outside Truck Driver, Transfer Truck (Trucking Service) , max = $29.83 per hour, min = $29.83 per hour, % difference = 0%, occurs 7 times in the estimate, accounting for 0.13% of the total labor cost

Journeyman - 3.1.1 Outside Truck Driver, Semi End Dump (Trucking Service) ,

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

There should actually only be two different wage rates, and MII has been changed so that this is the case. The reason for this is because of the Prevailing Wage rules. Material from a commercial plant delivered to the project, the driver does not get paid PW rates, rather they are paid a private wage. A driver who's sole job is to deliver material does not get PW. A driver that only works on the site, a water truck driver for instance would get PW because he is working on site. A driver moving soils from a government supplied borrow site would also get PW, but if the source is procured by a business, they would not. I spoke to a truck broker, and obtained their hourly rates for different types of trucks, they are basically $98/hr. Crews are created using the equipment cost book so that equipment costs an fuel can be easily adjusted. The hourly labor rate is the difference between the truck broker rate and the equipment rate. Because of this, there is a very good reason that there are two different rates. Most contractors do not own their own trucks, they usually go thru truck brokers for all their transportation needs. Water trucks on the other hand are a different story and they get paid PW.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**

Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

Current Comment Status: **Comment Closed**

6213721 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

24. CONCERN: Equipment Rates. There are 125 different equipment items used in the estimate. 12% of the equipment costs are included in the 13 different most expensive equipment items below. Adjusting the equipment selection could have a significant impact to the total cost.

For example, consider the first item in the list below. From the region 7 equipment manual, a very similar equipment selection is EP T55JD004 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 29.7 CY, 41 TON, 6X6, REAR DUMP $142.84/hr. $15/hr more expensive x 111,187 hrs = 15,881,941, an increase of $1,750,448

BASIS: ETL 1110-2-573 Construction Cost Estimating Guide for Civil Works, ER 1110-2-1302 Civil Works Cost Engineering, ER 1110-1-1300 Cost Engineering Policy and General Requirements

SIGNIFICANCE: Medium

RESOLUTION: Please consider the most significant equipment items listed below and verify that the equipment selected is reasonable for the job. .

Description EQHours Total $/hr

TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 21.6-29.2 CY, 40.3 TON, 6 X 6 X 2, REAR DUMP 111,187 14,131,492 127

TRUCK, HIGHWAY, 50,000 LBS GVW, 3 AXLE, 6X4 (CHASSIS ONLY-ADD OPTIONS) 184,808 9,810,411 53

WORK TUG, 1000 HP 18,348 5,946,403 324

CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, LIFTING, 100 TON (91 MT), 200' (61.0 M) BOOM 12,202 1,210,512 99

LOADER, FRONT END, WHEEL, ARTICULATED, 10 CY (7.6 M3) BUCKET, 4X4 12,202 2,207,912 181

Base Drill Rig 5,060 3,076,480 608

HYDRAULIC EXCAVATOR, CRAWLER, 227,100 LBS, 8.50 CY BUCKET, 34.25' MAX DIGGING DEPTH 3,688 1,037,303 281

TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 21.6-29.2 CY, 40.3 TON, 6 X 6 X 2, REAR DUMP 111,187 14,131,492 127

SCRAPER, TANDEM POWERED, STANDARD LOADING, 32-44 CY (24-34 M3), 52 TON (47.2 MT), 4X4, D-11 ASSISTED LOADING 11,324 5,520,905 488

ROLLER, STATIC, SELF-PROPELLED, LANDFILL/SOIL COMPACTOR, SHEEPSFOOT, 4X4, 35 TON, 51" DIA, 16.00' WIDTH PER 2-PASS, W/BLADE 8,210 1,323,757 161

TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE (ADD ATTACHMENTS) 14,403 2,316,529 161

TRUCK, HIGHWAY, 55,000 LB (24,948 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES) 26,271 1,703,031 65

HYDRAULIC EXCAVATOR, CRAWLER 90,000 LB (40,823 KG), 2.50 CY (1.9 M3) BUCKET, 30.4' (9.3 M) MAX DIGGING DEPTH 10,146 1,016,127 100

TRUCK TRAILER, BOTTOM DUMP, 18 CY (13.8 M3), 27 TON (24.5 MT) (ADD TOWING TRUCK) 114,916 1,060,393 9

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 27 2015

1-0 Evaluation **Concurred**

a) Both trucks are just as reasonable as the other. This is more of an optimization issue that will be determined later

b) This equipment item is basically the equipment portion of the on road haul trucks and

water trucks

c) Required to push rip rap ~74 miles from Assumed San Francisco to about DWSC mile 37

d) Used for offloading rip rap. This size needed so that can reach out over barges and place onland

e) Used to load rip rap. Smaller size would hamper production.

f) Equipment used for Deep Soil Mixing and is the normal equipment used for this type of construction. Equipment rate is from CalTrans Rental book.

g) Normal piece of equipment used for excavator method of excavation for slurry walls to 85' deep.

h) Reasonable compactor to meet compaction requirements for soils being placed in new levee and levee backfill after installation of slurry walls.

i) Reasonable size dozer for most work on project. Stripping, ripping, general grading all very reasonable due to soils conditions on this project.

j) Reasonable sized machine for use in clearing, underground, loading of trucks type operations.

k) Used in crews for hauling soils and baserock. Reasonable to be used in estimate for equipment trailer. Capacity is over what can legally be hauled in CA. Unit rate reasonable.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015
Current Comment Status: **Comment Closed**

6215823 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: A risk analysis has not been provided

BASIS: Cost Engineering Criteria

RESOLUTION: Provide risk analysis when available.

Submitted By: Gary Smith (651 260 1819). Submitted On: Aug 28 2015

1-0 Evaluation **Concurred**
CSRA electronic file has been sent for review.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Open Comment**
As of 9/7/2015, I cannot find that I have received the csra

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 07 2015

2-0 Evaluation **Concurred**
CSRA sent. CSRA & TPCS to be updated when notified that all comments will be closed upon final submission of final MII/CSRA/TPCS

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 10 2015

2-1 Backcheck Recommendation **Close Comment**
Risk analysis received 9/92015. Comment Closed

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 10 2015
Current Comment Status: **Comment Closed**

6218152 Environmental n/a GENERAL n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: EIS/EIR)

CONCERN: For Information Only. EIS/EIR is well written containing a systematic/consistent review of impacts according to Corps and CEQ Regulations. The PDT had a good understanding of Corps Levee Vegetation requirements which is important for this analysis. No major concerns with document. Nice job!
BASIS FOR CONCERN: ER200-2-2 and CEQ Guidelines
SIGNIFICANCE OF CONCERN: NA
ACTION NEEDED TO RESOLVE CONCERN:NONE

Submitted By: Michael Scuderi (206-764-7205). Submitted On: Aug 31 2015

1-0 Evaluation **Concurred**
concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Michael Scuderi (206-764-7205) Submitted On: Sep 04 2015
Current Comment Status: **Comment Closed**

6218165 Environmental n/a Table 3.6 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: EIS/EIR)

CONCERN: Table Title appears inconsistent with information provided
BASIS FOR CONCERN: Compensation is indicated on the title but there is no row listing proposed compensation
SIGNIFICANCE OF CONCERN: Medium
ACTION NEEDED TO RESOLVE CONCERN: Either eliminate compensation from title or add information from CE/ICA analysis

Submitted By: Michael Scuderi (206-764-7205). Submitted On: Aug 31 2015

1-0 Evaluation **Concurred**
Added a column with the proposed mitigation/compensation for each alternative and also updated the acreages based on USFWS BO and CAR. Updated Tables 3.6-1, 3.6-2, and 3.6-3.

Submitted By: Sarah Ross Arrouzet (916-557-5256) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Michael Scuderi (206-764-7205) Submitted On: Sep 04 2015
Current Comment Status: **Comment Closed**

6218166 Environmental n/a Pg 144; pg 195 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: EIS/EIR)

CONCERN: Different work windows
BASIS FOR CONCERN: There are two work windows listed here that are different. Difficult to determine which takes precedent or impact on construction schedule. Also GGS window is different. How does that fit in to the construction plan? This discrepancy appears several times in the EIS
SIGNIFICANCE OF CONCERN: Medium
ACTION NEEDED TO RESOLVE CONCERN: At minimum in mitigation measures section describe how these different work windows interact

Submitted By: Michael Scuderi (206-764-7205). Submitted On: Aug 31 2015

1-0 Evaluation **Concurred**
Updated the in water work windows to be consistent with the BO from NMFS (August 1-November 30). GGS work windows are April through October, but once measures are in place to keep GGS out of the construction area and with a monitor on site, work may continue past October. Work windows for GGS also refer to out of water work during the active season (April-October), in water work would not be a problem after October since GGS are then hibernating in the upland areas. Will update mitigation measures sections to address discrepancy.

Submitted By: Sarah Ross Arrouzet (916-557-5256) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Michael Scuderi (206-764-7205) Submitted On: Sep 04 2015
Current Comment Status: **Comment Closed**

6218168 Environmental n/a pg. 178 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: EIS/EIR)

CONCERN: Use of SAM Methodology
BASIS FOR CONCERN: SAM is introduced here but there is no explanation of how the values produced here fit into the CE/ICA analysis
SIGNIFICANCE OF CONCERN: Medium
ACTION NEEDED TO RESOLVE CONCERN: Enhance explanation of use of SAM and HEP in the impacts analysis.

Submitted By: Michael Scuderi (206-764-7205). Submitted On: Aug 31 2015

1-0 Evaluation **Concurred**
Updated language to say SAM was used to negotiate appropriate mitigation with Resource Agencies in order to identify long term impacts to fish species. SAM was not used in connection with the CE/ICA. The mitigation cost for SRA (salmon habitat) is directly related to the loss of SRA which was calculated by measuring habitat loss in the project area. Will add additional language in the impact analysis to better explain use of HEP relating to mitigation and CE/ICA.

Submitted By: Sarah Ross Arrouzet (916-557-5256) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Michael Scuderi (206-764-7205) Submitted On: Sep 04 2015
Current Comment Status: **Comment Closed**

6218170 Environmental n/a pg. 196 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: EIS/EIR)

CONCERN: No sure how mitigation will be formulated for the setback area given the wording presented in the hydrology section
BASIS FOR CONCERN: Hydrology section indicates potential flood level rise with setback. This could impact the effectiveness of the setback area for mitigation.
SIGNIFICANCE OF CONCERN: Medium
ACTION NEEDED TO RESOLVE CONCERN: Provide enhanced description of what types of mitigation are possible or clearly define what other analysis needs to be accomplished.

should also reflect this.

Submitted By: Michael Scuderi (206-764-7205). Submitted On: Aug 31 2015

1-0 Evaluation **Concurred**

Mitigation/restoration of the setback area will be designed further in PED depending on mitigation needs and best fit for habitat construction based on elevation and inundation of the site. Changed language in the Hydrology Section to indicate that the change in water surface elevation with the setback levee was determined not to be significant. Changed both sections.

Submitted By: Sarah Ross Arrouzet (916-557-5256) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Michael Scuderi (206-764-7205) Submitted On: Sep 04 2015

Current Comment Status: **Comment Closed**

6218867	Geotechnical	Section 11.4.12 - S. Basin - Yolo Bypass E. L - St. 10+00	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Geotechnical Appendix)

Previous review comment 5570098 stated: "Based on review of the analyses provided at this station, there is no engineering reason to construct a seepage cutoff wall for the "with project" condition at Sta. 10+00. Recommend that recommendation be revised." Comment was originally closed based on conversation with the District that clarification has been added that detail level design will further re-evaluate these alternatives.

Reviewer noted this language has been added in later sections of this report; however, it is recommended that similar language be added directly to Section 11.4.14. The gradients and slope stability factors of safety still do not support the recommended alternative of a cutoff wall to EL-60.

Submitted By: Brad Arcement (601-631-5899). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**

The feasibility analysis at the Sacramento River north levee does not demonstrate the need for seepage or stability mitigation. Several other reports prepared for WSAFCA by others indicated the need for seepage or stability mitigation modifications. Based on the information available at the feasibility level, and the conflict between recommendations from the sponsor and the Corps, the geotechnical recommendation was to recommend work in this area, with the final determination of need to be made during PED. We will add a clarification to 11.4.14 per the reviewer's comment.

Submitted By: Erik James (916-557-5259) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
Reviewer discussed the comment with the district and understands that clarification will be added to the report to satisfy the comment.

Submitted By: Brad Arcement (601-631-5899) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6218925 Geotechnical Table 13-10 n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Geotechnical Appendix)

Table 13-10 provides the geotechnical recommendations for the Sacramento Bypass North Levee. The recommendation is for construction of a "New Levee" for the Sacramento Bypass North Levee. This recommendation is not match the analyses completed at Sta. 8+30 that was used as the representative crosss section for this reach. The analyses completed for Sta. 8+30 is for a modification of the levee "in-place", not construction of a new levee. The "in-place" modifications analysed and presented in Section 11.5.1 include a levee raise and construction of a 80-ft wide berm. The recommendations in Table 13-10 include a "New Levee" with a 300-ft wide seepage berm or a "New Levee" with a 80-ft wide berm AND 20-ft deep cutoff wall.

The analyses that support the "New Levee" alternatives should be included in the report and Section 11.5.1 should be revised, or Table 13-10 should be revised to reflect the recommendations developed for the geotechnical analyses that include only a raise and berm.

Submitted By: Brad Arcement (601-631-5899). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
Analyses was performed on the existing Sacramento Bypass north levee to determine the performance of that levee as well as the general material composition of the levee. However, the project alternative recommendation was for a relocated north levee. There are no existing borings or other geotechnical data available for the location of the new north Sacramento bypass levee. Therefore, a conservative assumption was made regarding potential seepage or stability improvements required for the new north levee. These assumptions were intended to reasonably maximize real estate and environmental impacts for the planning study, with final determination of need to be determined in PED.

Submitted By: Erik James (916-557-5259) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
Reviewer discussed the comment with the District and understands that clarification will be added to the report to satisfy the response.

Submitted By: Brad Arcement (601-631-5899) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6218977 Geotechnical Levee Problems at Specific Locations n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Chapter 2 - Problem Identification)

The discussion for the North Basin and South Basin in Chapter 2 there are references to "probability of failure....". The use of the phrase "probability of failure" is incorrect and should be re-written to state "probability of poor performance" for each segment of the North and South Basin as discussed.

The probabilistic analyses presented in the Geotechnical Appendix does not provide a "probability of failure", but rather a "probability of poor performance" and has been corrected as such based on previous reviews. The use of the term "failure" implies breach of the levee prior to overtopping. The probabilistic analyses in the Geotechnical Appendix only provides a probability of initiation of seepage and stability failure modes. The actual probability of "failure" (breach) is lower than presented in the Geotechnical Appendix - which is why that section was re-written.

Submitted By: Brad Arcement (601-631-5899). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
Text has been changed as suggested.

Submitted By: Andrew Muha ((916) 557-6756) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
Understood that text has been changed as recommended.

Submitted By: Brad Arcement (601-631-5899) Submitted On: Sep 03 2015
Current Comment Status: **Comment Closed**

6219365 Real Estate n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

REVIEW CONCERN: REP Section 4 (page 10) discusses 15 foot permanent easements for providing maintenance access and flood fighting purposes. Would this be a (non-standard) perpetual access easement? There is no description of what type of easement would be acquired. In addition, this section does not mention the bank protection easements to be acquired and the purpose of those estates.
BASIS FOR THE CONCERN: ER 405-1-12
SIGNIFICANCE OF THE CONCERN: Low
RECOMMENDED ACTION: Recommend adding more description of the type of estate to be acquired for access/flood fight purposes, and discussion of the bank protection easement.

Submitted By: Karen Vance (5048621349). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
Page 24 discussed bank protection easements but I will add a discussion of bank protection on Page 10 as well. Thes easemetns required are levee easements and O&M corridors. They are standard estates. I can add a clarification senctence.

Submitted By: Laurie Parker (557-6741) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Karen Vance (5048621349) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6219366 Real Estate n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

REVIEW CONCERN: ER 405-1-12 specifies that in the REP, there should be discussion of any previous Real Estate Plans that were prepared for the project. The REP mentions a feasibility report was completed in 1992 and project costs presented to Congress in 2009 and 2011. Was there an REDM/REP for the originally authorized project? The GRR is a result of a Post Authorization Change – was a REP prepared for the PAC as well?
BASIS FOR THE CONCERN: ER 405-1-12
SIGNIFICANCE OF THE CONCERN: Low
RECOMMENDED ACTION: Recommend including some discussion of previous Real Estate Plans prepared for the project and any changes that may have occurred since that time.

Submitted By: Karen Vance (5048621349). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
Yes there is a real estate appendix from the previous feasibility report. The existing levees have levee easements already except the South Cross Levee which is a private levee to be converted to a federal levee. They executed flowage easements in Yolo Bypass and Sacramento Bypass were executed in the 1940's and 1950's. There were tempoary construction easements executed, borrow easments and fee title for mitigation.

Submitted By: Laurie Parker (557-6741) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Karen Vance (5048621349) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6219367 Real Estate n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

REVIEW CONCERN: Table 4 on Page 16 is inconsistent with the same table shown as Table 4-4 in Chapter 4 of the GRR. The acreages/costs in the main report differ from what is shown in the REP.
BASIS FOR THE CONCERN: ER 405-1-12
SIGNIFICANCE OF THE CONCERN: Low
RECOMMENDED ACTION: Revise Table 4 in the REP to be consistent with the main report.

Submitted By: Karen Vance (5048621349). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
My table 4 should be consistant with Table 4-4, Chapter 4 of the GRR. I will reinsert new table.

Submitted By: Laurie Parker (557-6741) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Karen Vance (5048621349) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6219368 Real Estate n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

REVIEW CONCERN: There is a discussion in the REP of several railroad parcels to be acquired as part of the lands required for the project. Will acquisition of these parcels present any significant issues relating to project schedule or the overall project plan?
BASIS FOR THE CONCERN: ER 405-1-12
SIGNIFICANCE OF THE CONCERN: Low
RECOMMENDED ACTION: Recommend further discussion of any issues that could arise as a result of this acquisition plan including railroad parcels.
REVIEW CONCERN: There is a discussion in the REP of several railroad parcels to be acquired as part of the lands required for the project. Will acquisition of these parcels present any significant issues relating to project schedule or the overall project plan?
BASIS FOR THE CONCERN: ER 405-1-12
SIGNIFICANCE OF THE CONCERN: Low
RECOMMENDED ACTION: Recommend further discussion of any issues that could arise as a result of this acquisition plan including railroad parcels.

Submitted By: Karen Vance (5048621349). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
The railroad parcels occur in Port North reach. A flood wall is the construction feature that crosses the railroad track. A new location for the floodwall may avoid disrupting the railroad parcels. In PED suggest a new alighment to avoid delay to cost and schedule. Definetly a risk register item.

Submitted By: Laurie Parker (557-6741) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Karen Vance (5048621349) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6219370 Real Estate n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

REVIEW CONCERN: Section 5, page 23 – Although it is apparent that the City and the State are Non Federal Sponsors for the project, there is no statement to that effect. Additionally, there is a Capability Assessment for both, so it is assumed that both will be responsible for LERRDs acquisition.
BASIS FOR THE CONCERN: ER 405-1-12
SIGNIFICANCE OF THE CONCERN: Low
RECOMMENDED ACTION: Recommend mentioning at the beginning of Section 5 who the NFS is and who is responsible for LERRDs acquisition.

Submitted By: Karen Vance (5048621349). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
Will provide a clarifying sentence on who the NFS is.

Submitted By: Laurie Parker (557-6741) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Karen Vance (5048621349) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6219623	Planning - Plan Formulation	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Based on my review of Chapter 3 of the West Sacramento Project GRR, I have no technical comments on the plan formulation strategy assuming there are no major issues from other ATR SME's. The attached graphs and following discussion provides the rationale for my response.

The step-wise plan formulation process used is a logical approach. The plan formulation strategy is based on the existing condition defined in Section 3.11: "There are some reaches of levees where the seepage and stability issues are worse than other reaches. However, improving those reaches moves the point(s) of greatest concern to the next location. West Sacramento is surrounded by a system of levees, the performance of each segment of the system is essential of functioning of the entire levee system."

The PDT initially identified an array of structural and non-structural management measures. Measures were screened using a combination of preliminary cost estimates for some measures and professional judgment. Remaining measures were then combined to formulate 12 structural and 1 non-structural Alternatives. These Alternatives were evaluated and screened using Completeness; Efficiency, based on parametric cost estimates; Effectiveness; and Acceptability criteria. The evaluation metrics used are shown in Table 3-18 (the initial assessment of the preliminary array of alternatives indicated that Alternative 5 would potentially be the NED plan). A final array of the 3 top candidate Alternatives (Alternatives 1, 3, and 5) were retained for more detailed evaluation. The more detailed evaluation resulted in the verification and selection of Alternative 5 as the NED

Plan.

Editorial comments on Chapter 3 and other Chapters will be provided by separate correspondence.

(Attachment: West_Sacramento_NED_Plan_Review.pdf)

Submitted By: Gene Lilly (918-669-7196). Submitted On: Sep 01 2015

1-0 Evaluation **Concurred**
Thanks for the positive feedback

Submitted By: Andrew Muha ((916) 557-6756) Submitted On: Sep 02 2015

1-1 Backcheck Recommendation **Close Comment**
The response is to my satisfaction. Thank you.

Submitted By: Gene Lilly (918-669-7196) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6220224 Civil Table 3 17 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

1. REVIEW CONCERN: Unsure if the proposed features in Table 3 match those listed in Attachment E - Civil Design Engineering Appendix? (Note: Attachment E was not provided as part of the review documents.)

2. BASIS FOR THE CONCERN: The proposed features in Table 3 do not match those in Table 4 of the Draft Civil Engineering Appendix dated December 2014. As such, I feel that the information in "Attachment E - Civil Design Engineering Appendix" may be in conflict with Table 3.

3. SIGNIFICANCE OF THE CONCERN: Possible conflict between Table 3 and those listed in Attachment E - Civil Design Engineering Appendix.

4. ACTION NEEDED TO RESOLVE THE CONCERN: Compare Table 3 to the comparable table in the referenced "Attachment E - Civil Design Engineering Appendix" and verify that they cite the same information. If they do not revise either Table 3 or the Engineering Appendix so that they provide the same information.

Submitted By: Norman Gartner (501-324-5274). Submitted On: Sep 02 2015

1-0 Evaluation **Concurred**
Civil Design Engineering Appendix and other appendixes will be provided for review and backcheck. The table 4 of the draft civil engineering appendix was revised to match table 3 in the engineering appendix.

Submitted By: Benson Liang (916-557-6768) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Open Comment**
Revised appendices were not provided.

Submitted By: Norman Gartner (501-324-5274) Submitted On: Sep 08 2015

1-2 Backcheck Recommendation **Close Comment**
Revised engineering appendix was received and rev iewed. Table 4 in Attachment E has been revised to match Table 3.

Submitted By: Norman Gartner (501-324-5274) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6220232 Civil 1.2.3 3 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

1. REVIEW CONCERN: The wrong Figure number is cited in the first sentence.

2. BASIS FOR THE CONCERN: Figure 3 is the Early Implementation Project map.

3. SIGNIFICANCE OF THE CONCERN: Minor clarification.

4. ACTION NEEDED TO RESOLVE THE CONCERN: Change "Figure 2" to "Figure 3".

Submitted By: Norman Gartner (501-324-5274). Submitted On: Sep 02 2015

Revised Sep 02 2015.

1-0 Evaluation **Concurred**
The figure number in the first sentence was revised to Figure 3.

Submitted By: Benson Liang (916-557-6768) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Comment resolved.

Submitted By: Norman Gartner (501-324-5274) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6220239 Civil Table 2 and Table 3 15 & 17 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

1. REVIEW CONCERN: The reach length for the Sacramento River South Levee does not match between Tables 2 and 3.

2. BASIS FOR THE CONCERN: Table 2 lists the reach length as 33,100 and Table 3 lists it as 30,000.

3. SIGNIFICANCE OF THE CONCERN: Minor clarification.

4. ACTION NEEDED TO RESOLVE THE CONCERN: Determine which reach length is corrrect

and revise the appropriate Table accordingly.

Submitted By: Norman Gartner (501-324-5274). Submitted On: Sep 02 2015

Revised Sep 02 2015.

1-0 Evaluation **Concurred**
The reach length in the table 3 was revised to 33,100.

Submitted By: Benson Liang (916-557-6768) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Comment resolved.

Submitted By: Norman Gartner (501-324-5274) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6220244 Civil South Cross Levee 20 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

1. REVIEW CONCERN: The reach length for South Cross Levee does not match Table 3.

2. BASIS FOR THE CONCERN: Table 3 lists the reach length as 6400 feet and this section lists it as 6300 feet.

3. SIGNIFICANCE OF THE CONCERN: Minor clarification.

4. ACTION NEEDED TO RESOLVE THE CONCERN: Determine which reach length is corrrect and revise the appropriate Table or section accordingly.

Submitted By: Norman Gartner (501-324-5274). Submitted On: Sep 02 2015

Revised Sep 02 2015.

1-0 Evaluation **Concurred**
The number 6300 in the section was revised to 6400 feet.

Submitted By: Benson Liang (916-557-6768) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Comment resolved.

Submitted By: Norman Gartner (501-324-5274) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6220249 Civil DWSC West Levee 20 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

1. REVIEW CONCERN: The reach length for the DWSC West Levee does not match Table 3.

2. BASIS FOR THE CONCERN: Table 3 lists the reach length as 99,010 feet and this section lists it as 99,000 feet.

3. SIGNIFICANCE OF THE CONCERN: Minor clarification.

4. ACTION NEEDED TO RESOLVE THE CONCERN: Determine which reach length is corrrect and revise the appropriate Table or section accordingly.

Submitted By: Norman Gartner (501-324-5274). Submitted On: Sep 02 2015

1-0 Evaluation **Concurred**
The number in the section was revised to 99,010 feet.

Submitted By: Benson Liang (916-557-6768) Submitted On: Sep 04 2015

1-1 Backcheck Recommendation **Close Comment**
Comment resolved.

Submitted By: Norman Gartner (501-324-5274) Submitted On: Sep 08 2015
Current Comment Status: **Comment Closed**

6221931 Cultural Resources Section 3.9 pages 195 to 205 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

The report 1) lacks documentation and text that cultural resources were integrated entirely into project development as part of the Planning Process and 2) the report text concerning cultural resources does not specifically define the Area of Potential Effect (APE). A recommendation and suggestion would be to focus on a description and discussion of the proposed alternative recommended by the report relative to the identification and delineation of the APE, and the steps taken to reduce affects to historic properties in the context of project development and planning.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
The location of cultural resources are not know for the entire project footprint. There has not been a systematic cultural resources survey for the Project Area. A records search of the APE does provide information for some know sites. There have been no actual project plans engineered for this project because it is being completed in phases. The avoidance of Cultural resources during later project specific development will have this information and considered during design.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
It seems that although the project is being engineered in phases an attempt for the protection of historic properties has been attempted.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6221936 Cultural Resources Section 3.9 pages 195 to 205 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

This section would be dramatically improved by the removal of text that contain a general overview of the cultural resources and the context of historic properties relative to the National Historic Preservation Act, rather than a focused approach toward a description of project specific and existing conditions relative to historic properties that would be potentially affected by the project, and the documentation of, and the definition of the APE. Recommendations would be removal of those sections of the report and begin the Section 3.90 with the "Results of the Record Search" section on page 204.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **For Information Only**
This information is standard for SPK to include in its NEPA docuements.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
Although requirements of NEPA documents are often dictated by the Corps standardized and traditional processes, and also, often directed by reviewers' comments, non-project specific overviews are not a legal requirement and unnecessarily add to the length of the NEPA document. The reviewer found the evaluator's comment acceptable.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6221987 Cultural Resources Section 3.9 page 205 and page 208 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

The referenced Figure 3.9-3 is missing from the report. The lack of a justifiable APE induces risks throughout the planning process phases, which increase exponentially, through and during construction. The recommendation is to include appropriate figures and text.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
I will let our lead planner know that this figure is missing and it will be added.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
The evaluation is acceptable.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6221995 Cultural Resources Section 3.9 pages 195 to 211 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

A major deficiency of this section is the lack of focus on coordination of the APE, eventually leading to the Programmatic Agreement for the protection of historic properties. It is paramount that the report documents the coordination process, effort, and responses. The coordination and consultation effort should reference to an appendix containing evidence of those, meetings, letters, correspondence, and responses. The recommendation for section 3.9 is to: 1) describe and document the coordination and consultation of the APE, as promulgated under Section 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR Part 800, and consultation with Tribes and other interested and consultation parties, 2) full disclosure of coordination and consultation of the APE and how the Corps took measure of reduce effect to historic properties, and to 3) document and delineate the coordination and consultation leading to the proposal and development of a draft programmatic agreement, placing all permanent correspondence in an appendix.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
The APE was coordinated with the SHPO. Documentation of coordination will be appended to the EIS.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
The evaluation and corrective measures are acceptable.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222002 Cultural Resources Section 3.9 Page 208 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

The last sentence "The APE was described and consulted with the State Historic Preservation Officer." This correspond should referenced a dated letter, which should be reference to the appropriate report appendix with all correspondence and responses, and mention of lack of responses. A recommendation would be to reference the appropriate consultation and coordination

relative to National Historic Preservation Act that: 1) contributed to the identification and protection of historic properties, sacred sites, traditional historic properties and 2) resulted in the identification and delineation of the APE.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
The correspondance will be referenced in the document and the appropriate attachments will be appended to the document.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
The evaluation and corrective measures are acceptable.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222005 Cultural Resources Section 3.9.2 pages 212 to 213 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Portions of the "Methodology and Basis of Significance" section seem out of place. A suggestion would be to place the "Past NHPA/CEQA Compliance for the West Sac GRR Study" effort in the existing conditions and past coordination cultural resource sections of the report, keeping the "Methodology" and "Basis of Significance".

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
I will discuss this with our lead planner.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the suggestion has been made.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222008 Transportation Section 3.10 page 219 n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Transportation and Navigation (There is nothing in this section and it should be removed or completed). A recommendation would be to provide introductory text for this section.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
I will discuss this with our lead planner.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the suggestion has been made.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222012 Cultural Resources Section 5.1 Pages 417-419 n/a
Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

This Section can be significantly reduced. A recommendation would be to state as to whether compliance has process met, how compliance is being met, and that the protection of historic properties will occur through the execution of a Programmatic Memorandum of Agreement, prior to a signed Record of Decision.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
I will discuss this with our lead planner.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the recommendation has been made.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222015 Cultural Resources N/A N/A N/A
Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

Appendix C: Draft Programmatic Agreement (PA) It is recommended to change the title of the cover page be "Appendix C: Draft Programmatic Agreement"

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
I will discuss this with our lead planner.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the recommendation has been made.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222018 Cultural Resources N/A N/A N/A

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

Appendix C: Draft Programmatic Agreement (PA) ATTACHMENTS (the last section of the PA). It is recommended that this section of the PA should have its own heading (i.e., XXIII. ATTACHMENTS) or (XXIII. ATTACHMENT).

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
I will discuss this with our lead planner

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the recommendation has been made.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222019 Cultural Resources N/A N/A N/A

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

Appendix C: Draft Programmatic Agreement (PA). It is recommended that the pages of the ATTACHMENT(S) should be numbered

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
This has been updated and there are not numbers on the bottom of the page

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the recommendation has been made.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015

2-0 Evaluation **Concurred**
THe PA has been rewritten and the numbers are on the new document.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 09 2015
Backcheck not conducted
Current Comment Status: **Comment Closed**

6222020 Cultural Resources N/A N/A N/A
Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

ATTACHMENT A: A project "Description of Project and Alternatives" is typically not attached to a PA. It is recommended that the PA should reference the West Sacramento General Revaluation Report, Final Environmental Impact Statement/Environmental Impact Report for the "Description of Project and Alternatives" as the FINAL and BEST source for the description of the alternative and tentatively selected plan (or preferred "final" alternative).

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Non-concurred**
The CA SHPO requested an attachment noting the the "Descripton and Project Alternatives" Our SHPO does not want to see the NEPA/CEQA documents during their review and have to search for the sections.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
New amendments to the National Historic Preservation Act in 2000 indicated the integration of the Section 106 process with the National Environmental Policy Act is acceptable under appropriate circumstances. Since the Corps is the lead federal agency of this action, it is the Corps decision to integrate both Acts for compliance. Also, if the process is being engineering in phase the reviewer questions how can the Area of Potential Effect be fully and accurately described. Since this is a request from the CA SHPO and the "Description of Project and Alternatives" is an acceptable appendix to the Programmatic Agreement, the reviewer acquiesces.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222021 Cultural Resources N/A N/A N/A
Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

ATTACHMENT B: Area of Potential Effects and Alternatives. It is recommended that this attachment should be the most updated map of the tentative selective plan or final alternative with the APE identified (state that that figure/map(s) would be updated, modified, added to, and/or replaced in the PA, as necessary during the life of the PA).

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
The updated APE will be added to the package that goes to SPD and Headquarters

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the recommendation has been made and corrective measures taken.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222022 Cultural Resources N/A N/A N/A

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

ATTACHMENT C: This attachment Historic Properties Management Plan should have been coordinated separately from the PA and approved by the SHPO, TRIBES, and interested and consulting parties and therefore, need not be a permanent attachment to the PA. It can have a correspondence section with a cover sheet SUMMERIZING ALL of the correspondence by date and subject, and a dated summery of the each and all responses or any lack of any response. Documentation of a lack of response should be mentioned. All Corps correspondence and responses can be appended to this sheet, if necessary. If this is too bulky and not required, reference in the correspondence and consultation summary sheet that all correspondence is on permanent file at the Sacramento District. It is recommended that the HPMP be coordinated separately from the PA, and not be attached to the PA, and that execution of the PA be predicated upon the acceptance of the final HPMP.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
It was requested by the SHPO that an HPMP be developed in conjunction with the PA. It was attached an appendix to the EIS with the PA as part of the Cultural Resource appendices and not neccesarly as an attachment to the PA.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
Consideration of the recommendation has been made, but signatories may be confused to the status of the HPMP relative to the execution of the PA.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222025 Cultural Resources N/A N/A N/A

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

Attachment C: Historic Properties Management Plan (HPMP) in the ATTACHEMENTS section co-authored by the West Sacramento Area Flood Control Agency. The HPMP can be coordinated separately from the PA and approved by the SHPO, TRIBES, and interested and consulting parties and therefore, need not be a permanent attachment to the PA. It is recommended that the HPMP state as to whether the HPMP is to be implemented by both parties or just by the Corps. If it is implemented by both parties, discuss why the West Sacramento Area Flood Control Agency isn't a signatory/concurring party to the PA.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
The HPMP is in draft form and will be coordinated and finalized after the PA has been signed. " coordinated separately" The HPMP is to be implemented by the Corps. Therefore the WSAFCA is not a signatory to the PA.

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
the reviewer concurs with the process described by in the comment evaluation.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222028 Cultural Resources N/A N/A N/A

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Appendix C: Draft Programmatic Agreement)

Attachment C: Relative to the "Curation of Recovered Material," the HPMP states, "Archaeological materials collected during the project activities will remain property of the WSAFCA." This implies that all materials will be obtained from land owned by the WSAFCA or those investigations and material collections will occur after real estate ownership is procured. This may result in eventual ownership problems. This could state generally that, "All materials collected will be identified by each designated land owner(s) and curated as property of the designated land owner(s)."

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
The HPMP is in draft form and this text will be changed to reflect that state law will be followed regarding property ownership and collections/burials

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 09 2015

1-1 Backcheck Recommendation **Close Comment**
The reviewer concurs with the evaluation.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6222039 Cultural Resources N/A N/A N/A

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Record of Descision (to be written))

Project Record of Decision (ROD): It is recommended that the ROD should have a reference to the executed PA for the protection of historic properties. It is suggested that the executed PA, as well as all agreement documentation included in the ROD package.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: Sep 03 2015

1-0 Evaluation **Concurred**
This comment will be provided to the Planner for this project and it will be included in the FInal ROD

Submitted By: Dawn Sullo (916-557-7628) Submitted On: Sep 03 2015

1-1 Backcheck Recommendation **Close Comment**
The reviewer concurs with the evaluation.

Submitted By: Ronald Deiss (309-794-5185) Submitted On: Sep 09 2015
Current Comment Status: **Comment Closed**

6229987 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Filename SPK - West Sacramento - CSRA - 2015-09-09 - DRAFT.xlsm. I am concerned that there may not be enough risk to cost from estimate assumptions on crew members and production rates. Best = -$36,066,750 most likely = $0 high = $72,133,500 total estimated construction cost = 850,019,780.30. This could be a 5% contribution to cost contingency and I would expect 10%.

Resolution: Please consider increasing the risk for the high value.

Submitted By: Gary Smith (651 260 1819). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Per recommendation, ET1-Estimate Assumptions has been changed to a -5%, 0, +10% cost distribution

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 11 2015

1-1 Backcheck Recommendation **Close Comment**
Change observed. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6230004 Cost Engineering n/a n/a n/a
Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Filename SPK - West Sacramento - CSRA - 2015-09-09 - DRAFT.xlsm.

Please consider adding risk items to cover cost increase from changes to design based on changes to criteria, or development of better solutions. This could be a significant risk considering the duration of this project.

Submitted By: Gary Smith (651 260 1819). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Risk TL6 – Design Criteria had been discussed with the PDT. PDT felt that while criteria changes were likely, impacts would be negligible. It can also be argued risk is also captured in TL13 Quantity Variations and TL12 Design Development.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 11 2015

1-1 Backcheck Recommendation **Close Comment**
Understood. Comment Closed.

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6230007 Cost Engineering n/a n/a n/a
Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Filename SPK - West Sacramento - CSRA - 2015-09-09 - DRAFT.xlsm.

Please consider adding risk items to cover cost increase from changes to the project scope.

Submitted By: Gary Smith (651 260 1819). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
TL-13 has been added to the risk register and modeled.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 15 2015

1-1 Backcheck Recommendation **Close Comment**
Understood. Comment Closed

Submitted By: Gary Smith (651 260 1819) Submitted On: Sep 15 2015

Current Comment Status: **Comment Closed**

6230323 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

1. OBSERVATION: The CSRA made available to start ATR on 9 Sep 2015.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 10 2015

1-1 Backcheck Recommendation **Close Comment**
Final contingencies running about 32%.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015

Current Comment Status: **Comment Closed**

6230324 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

2. CONCERN: The 2015 PDT members attending the risk register update exclude Contracting, Construction and Geotechnical. Just 5 PDT members were included on a $1B project.
SIGNIFICANCE: VERY HIGH. Inclusion of PDT members for risk analyses has been stressed many times from the HQ level. That list will be included in the risk analysis report.
RESOLUTION: Confer with the PDT members cited and include on the membership attendance.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Meetings are being scheduled and comment addressed. Will submit revised meeting attendence register documenting dates met.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 11 2015

1-1 Backcheck Recommendation **Close Comment**
Contracting and geotech aded. The cost engineer also served as the construction rep.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015

Current Comment Status: **Comment Closed**

6230325 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

3. Risk CO1 Differing Site Conditions – CONCERN: The risk register refers to the risk as Mods and Claims. The model and the sensitivity chart refers to the same risk as Differing Site Conditions. SIGNIFICANCE: HIGH. RESOLUTION: Rename the model and charts to Construction Mods and Claims.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
All titles now state Modifications and Claims.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 11 2015

1-1 Backcheck Recommendation **Close Comment**
Confirmed.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6230327 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

4. Risk ET 1 Estimate Assumptions and Quantities - CONCERN: This risk appears to be the 2nd most variable risk and is a composition of estimate assumptions and quantities. Looking at the supporting documentation, the risk was actually modeled as quantity impacts only. Further, the variance values are the same as risk TL12 Design Development, suggesting a possible duplication or correlation. The actual estimate assumptions were not apparently modeled but could be assumptions related to contractor markups and assignments, construction methodology, crews and productivity, borrow sources and haul distances. SIGNIFICANCE: VERY HIGH because estimate assumption were not included yet show us as a high risk by virtue of title. RESOLUTION:

•Separate the various estimate risks into separate categories as described.

•Address whether risks TL12 and ET1 are duplicated or correlated risks.

•Move quantity confidence into Technical Risks.

•Address the quantity confidence for each of the major construction elements separately.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
ET1 has been revised to reflect only Estimate Assumptions. Risk TL13 – Quantity Variations has been added and modeled separately for quantity variations for Relocations, Fish and Wildlife Facilities, Levees and Floodwalls and Bank Stabilization. Quantity Variations are correlated with TL12 - Design Development.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 11 2015

1-1 Backcheck Recommendation **Close Comment**
Confirmed.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6230342 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

5. Risk TL8 Vegetation Variance – CONCERN: When considering variance values, this should be the highest risk variable presented. Yet, since the probability assigns a 10%, the risk does not show up as a high risk on the sensitivity chart. Also I note that is modeled as a uniform distribution, suggesting the cost impacts are REALLY unknown. SIGNIFICANCE: VERY HIGH. RESOLUTION: Study further with supporting data. Provide a basis for the cost variance. Model as a triangular distribution if reasonable. Reconsider the 10% probability. Ensure it is clearly covered w/in the final CSRA report.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Issue was discussed again with SPK PDT and potential cost impacts reassessed. Potential cost impacts have been decreased dramatically with potentially costs impacts ranging from $7M to $11.5M. 10% probability of occurrence remains as district has received a vegetation variance for Natomas project and it's entirely likely (assumed 90% likely) they will also receive a variance for West Sac.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 11 2015

1-1 Backcheck Recommendation **Close Comment**
Noted.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6230343 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

6. Risk Level – CONCERN: Some low modeled risks actually show a higher variance and impact than certain moderate risks. Some moderate risks in the model suggest that they are actually low due to the small value. SIGNIFICANCE; HIGH since it leaves a false impression in the risk register, part of the CSRA report. RESOLUTION: Re-lable those risks as moderate risks.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Some items labeled LOW Cost Risk were still modeled because moderate or higher schedule risks had associated cost impacts. The schedule risk were moderate to high risk event that would need to be addressed.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 11 2015

1-1 Backcheck Recommendation **Close Comment**
Explanation accepted.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6230344 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

7. Risk Model – CONCER: The latest risk model is based on $942M and excludes real estate. But then the TPCS includes the same contingency % for Real Estate. I do not find a Real Estate report supporting the TPCS. SIGNIFICANCE: HIGH since the base cost is estimated at $163M. RESOLUTION: Provide the Real Estate report. Confer w/ the RE office regarding contingencies.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Please review the file named "West Sac RE contingencies" which is from the RE report. It may be necessary to remove the contingency shown in the TPCS for the RE items.

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 10 2015

1-1 Backcheck Recommendation **Close Comment**
PDT is currently sorting out the RE contingency, excluded from the CSRA.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6230345 Cost Engineering n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Risk Analysis)

8. CSRA Report: Upon ATR resolution, provide the final CSRA report for the Vertical Team.

Submitted By: Jim Neubauer (509-527-7332). Submitted On: Sep 10 2015

1-0 Evaluation **Concurred**
Concur

Submitted By: Joe Reynolds ((916) 557-7573) Submitted On: Sep 10 2015

1-1 Backcheck Recommendation **Close Comment**
CSRA report will not delay the TPCS for Cost Certification.

Submitted By: Jim Neubauer (509-527-7332) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

6231647 Economics n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

I have no comments on the revisions to the economic appendix.

Submitted By: Brian Harper (571-239-0726). Submitted On: Sep 11 2015

1-0 Evaluation **Concurred**
No Comments noted by the ATR Lead for this review

Submitted By: Miki Fujitsubo ((916) 557-7440) Submitted On: Sep 15 2015

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Miki Fujitsubo ((916) 557-7440) Submitted On: Sep 15 2015
Current Comment Status: **Comment Closed**

Enclosure 2

COMPLETION STATEMENT OF AGENCY TECHNICAL REVIEW

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the **WEST SACRAMENTO PROJECT, FINAL GENERAL REEVALUATION REPORT, AND FINAL ENVIRONMENTAL IMPACT STATEMENT /ENVIRONMENTAL IMPACT REPORT, SEPTEMBER 2015**, Sacramento District. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214, 15 December 2012, Water Resources Policies and Authorities, CIVIL WORKS REVIEW. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR did assess the District Quality Control (DQC) documentation and found it to be adequate. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks.

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Miki Fujitsubo, NTS for
Marc L. Masnor, P.E. Date
ATR Team Leader
CESWF-PEC-PF (Tulsa, OK)

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Date: 2015.09.16 09:00:11 -07'00'

Eric W. Thaut Date
FRM–PCX Deputy Director
Review Management Organization
CESPD-PDS

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Bryon L. Lake Date
Project Manager
CESPK-PM-C

DISTRICT'S STATEMENT

CERTIFICATION OF AGENCY TECHNICAL REVIEW SEPTEMBER 2015

Of the:

WEST SACRAMENTO PROJECT
FINAL GENERAL REEVALUATION REPORT, AND FINAL ENVIRONMENTAL IMPACT STATEMENT /ENVIRONMENTAL IMPACT REPORT SEPTEMBER 2015

Sacramento District

US Army Corps
of Engineers ®

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Subject: Agency Technical Review (ATR) of the **WEST SACRAMENTO PROJECT, FINAL GENERAL REEVALUATION REPORT, AND FINAL ENVIRONMENTAL IMPACT STATEMENT /ENVIRONMENTAL IMPACT REPORT, SEPTEMBER 2015**, Sacramento District.

Significant concerns and the explanation of the resolution of agency technical review comments for the subject ATR are as follows:

- None

References.

a. ATR guidance: EC 1165-2-214, 15 December 2012, Water Resources Policies and Authorities, CIVIL WORKS REVIEW.
b. The Review Management Organization for this review was the Flood Risk Management Planning Center of Expertise (FRM-PCX), Eric Thaut.
c. The ProjnetTM DrChecks Project and Review titles are: Project: (320653) West Sacramento General Reevaluation Report (GRR) (incl ATR & DQC Reviews)(P2# 320653) and Review: ATR Final GRR (7-28 Aug 2015)
d. The ATR review report is titled: FLOOD RISK MANAGEMENT, PLANNING CENTER OF EXPERTISE,RESOURCE MANAGEMENT ORGANIZATION'S, AGENCY TECHNICAL REVIEW REPORT, SEPTEMBER 2015, Of the: WEST SACRAMENTO PROJECT, FINAL GENERAL REEVALUATION REPORT, AND FIANL ENVIRONMENTAL IMPACT STATEMENT /ENVIRONMENTAL IMPACT REPORT, SEPTEMBER 2015, Sacramento District, and contains the ATR Completion Statement.

I certify that all comments resulting from ATR of the subject report have been closed to the satisfaction of the agency technical review team and the project delivery team.

Rick L. Poeppelman

Rick L. Poeppelman, P.E.
Chief, Engineering Division
CESPK-ED

17 Sept 2015
Date

for Alicia E. Kirchner
Chief, Planning Division
CESPK-PD

9/18/15
Date

ProjNet Report

Comment Report: Comment Evaluation/Backcheck Contribution by Michael Scuderi
Project: ARCF - General Reevaluation Report (GRR), TSP & Attachments, American River Common Features (ARCF), California (P2 #149827) **Review**: ATR Final EIS/EIR (10-14 Aug 2015) (*00031*)
(sorted by Discipline , ID)

Displaying 6 comments for the criteria specified in this report.

Id	Discipline	Section/Figure	Page Number	Line Number
6308793	Environmental	n/a	2. Mitigation Ratios for threatened and endangered species not explained	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: While the inclusion of the Mayhew HSI does help to explain why the 1:1.6 ratio is suggested there is an incomplete explanation of the mathematics that produced that number.
BASIS FOR CONCERN: ER 1105-2-100, C-3(e) (2) does require clear justification of ratios.
SIGNIFICANCE OF CONCERN: High
ACTION NEEDED TO RESOLVE CONCERN: Further explain the development of the 1:1.6 ratio for Mayhew and then carry this forward to American River example. A justification for the bump-up to 2:1 can be found at:
http://training.fws.gov/courses/csp/csp3112/resources/Mitigation/WetlandMitigationRatios.pdf and https://fortress.wa.gov/ecy/publications/documents/1006011.pdf and
https://fortress.wa.gov/ecy/publications/documents/1006011.pdf
http://escholarship.org/uc/item/6x36z0r6, and
http://www.ecy.wa.gov/programs/sea/wetlands/bas/vol2final/Appendix%208-F_Volume%202_.pdf are two examples of research into why higher ratios are justified for temporal loss.

Submitted By: Michael Scuderi (206-764-7205). Submitted On: Nov 30 2015

1-0 Evaluation **Concurred**
The District will update the HMMAMP to elaborate on how the 1:1.6 ratio was calculated for Mayhew. Additionally, further justification will be included regarding the need for 2:1 mitigation based on the quantity of habitat lost and the habitat quality and function lost through mitigation when creating new habitat to replace mature riparian habitat. Thank you for providing the attached articles as a resource for this justification.

Submitted By: Anne Baker ((916) 557-7277) Submitted On: Dec 01 2015

1-1	Backcheck Recommendation **Close Comment** Explanation sufficient. Revised language should be reviewed. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 03 2015.
1-2	Backcheck Recommendation **Open Comment** Revised language does not reflect justification for 2:1 ratio. Suggest either eliminate ratio or provide jsutification Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 18 2015.
1-3	Backcheck Recommendation **Close Comment** SPK provided justification of 2:1 ratio related to temporal loss and habitat benefits. Explanantion is sufficient to close out comments. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 18 2015.
	Current Comment Status: **Comment Closed**

Id	Discipline	Section/Figure	Page Number	Line Number
6308794	Environmental	n/a	3. Performance standards for mitigation measures are not included in mitigation plan	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: Performance criteria were changed to reflect physical aspects of the mitigation features (mainly survival) but are other measures such as percent cover better indicators of success. Also, that variable would better track with the HEP model (Northern Oriole) variables used in the impact analysis. Survivability might not be a consistent measure to use. Comment from Chemine Jackels "I imagine that percent survivability is difficult to assess after a couple of years. Percent coverage seems like a better metric, and should go up over time. We typically hold the contractor responsible for %100 survival after the first year. They need to replace plants that have died in the first year. These comments apply to all the vegetation monitoring metrics. "
BASIS FOR CONCERN: Required for Section 2036 of WRDA 2007. Performance criteria should be identified related to physical characteristics of the project and not on the survey of populations of species of concern.
SIGNIFICANCE OF CONCERN: Medium
ACTION NEEDED TO RESOLVE CONCERN: Consider adding other variables to monitor. At a minimum add some more explanatory text on why survivability is the best criteria to use (See my email notes also).
Submitted By: Michael Scuderi (206-764-7205). Submitted On: Nov 30 2015

1-0	Evaluation **Concurred** The District will update the performance standards. Concur that we will require the contractor to be responsible for 100% survivability during the first year. The District's assessment is that survivability percentage is a reasonable metric for the first three years, minimum. In addition, the District will monitor for percent cover starting at year one, and will include a performance standard for cover as a success criteria. The District also proposes to revise the criteria that requires the mitigation to meet "three consecutive years of survival" to "three consecutive years of survival following removal of supplemental irrigation". Submitted By: Anne Baker ((916) 557-7277) Submitted On: Dec 01 2015
1-1	Backcheck Recommendation **Close Comment** Explanation sufficient. Revised language should be reviewed. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 03 2015.
1-2	Backcheck Recommendation **Close Comment** Evaluation criteria changed to reflect cover as a criteria. Response is sufficient. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 08 2015.
	Current Comment Status: **Comment Closed**

Id	Discipline	Section/Figure	Page Number	Line Number
6308795	Environmental	n/a	3. Performance standards for mitigation measures are not included in mitigation plan	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: Why is there an expected decline in survivability from 75% to 60%
BASIS FOR CONCERN: It appears that there is a downward trend in vegetation survival that might continue after monitoring.
SIGNIFICANCE OF CONCERN: Medium
ACTION NEEDED TO RESOLVE CONCERN: Please explain if it is expected that survivability will level off and not continue declining trend. You can use or elaborate on past Sacramento projects.
Submitted By: Michael Scuderi (206-764-7205). Submitted On: Nov 30 2015

1-0	Evaluation **Concurred** The performance standards established in the table were not intended to portray a declining trend. Rather, they were intended to provide an outlet for meeting success in a scenario where a mitigation site is struggling. For example, if the site is not

	meeting success criteria following year 6, then the performance standard reduces to allow the mitigation to meet a lower standard instead. The District proposes to revise the performance standards to focus on percent cover in addition to survivability. The tables will be removed or revised to reflect the new standards. Ensuring that the vegetation meets survival criteria for three consecutive years following the removal of supplemental irrigation would ensure that any downward trends would not occur. Submitted By: Anne Baker ((916) 557-7277) Submitted On: Dec 01 2015
1-1	Backcheck Recommendation **Close Comment** Explanation sufficient. Revised language should be reviewed. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 03 2015.
1-2	Backcheck Recommendation **Close Comment** Survivability criteria have been downplayed verus usig cover as a monitoring criteria. Response sufficient. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 08 2015.
	Current Comment Status: **Comment Closed**

Id	Discipline	Section/Figure	Page Number	Line Number
6308797	Environmental	n/a	4. Adaptive Management is not included in mitigation plan.	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: No adaptive management plan was previously included
BASIS FOR CONCERN: Requirement of Section 2036 WRDA 2007
SIGNIFICANCE OF CONCERN: HIGH
ACTION NEEDED TO RESOLVE CONCERN:. AMP was added to HMMAMP. In section 2.6.4 at the beginning refer back to table 2. The only other factor to consider is are the costs details of the AMP sufficient for HQ review. Should not the costs be broken out by mitigation measure?
Submitted By: Michael Scuderi (206-764-7205). Submitted On: Nov 30 2015

1-0	Evaluation **Concurred** Will refer to the correct table in Section 2.6.4. The District will update the AMP to elaborate on the components of the cost estimate per year in tabular form. Submitted By: Anne Baker ((916) 557-7277) Submitted On: Dec 01 2015

1-1	Backcheck Recommendation **Close Comment** Explanation sufficient. Revised language should be reviewed. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 03 2015.
1-2	Backcheck Recommendation **Close Comment** Costs have been added to table. Thank you. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 08 2015.
	Current Comment Status: **Comment Closed**

Id	Discipline	Section/Figure	Page Number	Line Number
6308798	Environmental	n/a	5. Discounting of onsite mitigation and mitigation bank measures	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: Not enough detail is provided to justify the exact values of the discount rates. Why was .2 and .3 used and not 0 and .1? or some other numbers? It is also not clear how the temporal loss aspect factors into the mitigation determination.
BASIS FOR CONCERN: ER 1105-2-100 par. C-3(d)(5) requires justification for replacement rates.
SIGNIFICANCE OF CONCERN: HIGH
ACTION NEEDED TO RESOLVE CONCERN: Provide additional justification for discount rates even if it is BPJ or local expert analysis.
Submitted By: Michael Scuderi (206-764-7205). Submitted On: Nov 30 2015

1-0	Evaluation **Concurred** Justification for the 20% discount rate on onsite mitigation is provided through the HEP discussion. Please see Table 4 for justification of this discount. The District concurs that the additional 10% discount for mitigation banks is not justified. The ARCF GRR CE/ICA is being revised to remove this reduction. It was not applied to the West Sac GRR CE/ICA. Submitted By: Anne Baker ((916) 557-7277) Submitted On: Dec 01 2015

1-1	Backcheck Recommendation **Close Comment** Explanation sufficient. Revised language should be reviewed. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 03 2015.

1-2	Backcheck Recommendation **Close Comment** Discount has been explained by revised text. Removal of 0.10 for off-site is acceptable. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 08 2015.
	Current Comment Status: **Comment Closed**

Id	Discipline	Section/Figure	Page Number	Line Number
6308799	Environmental	n/a	Responses to 6, 7, and 8 HQ Responses	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

FOR INFORMAITON ONLY: Mitigation Plan rewrite is adequate.

Submitted By: Michael Scuderi (206-764-7205). Submitted On: Nov 30 2015

1-0	Evaluation **Concurred** Thank you for your concurrence/review. Submitted By: Anne Baker ((916) 557-7277) Submitted On: Dec 01 2015

1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Michael Scuderi (206-764-7205) Submitted On: Dec 03 2015.
	Current Comment Status: **Comment Closed**

Report Complete

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- Patent 11/892,984 property of ERDC since 2004.

CESWF-PEC-PF (Tulsa, OK) January 14, 2016

MEMORANDUM FOR RECORD

SUBJECT: Targeted Agency Technical Review of the Habitat Mitigation Monitoring and Adaptive Management Plan, December 2015 - AMERICAN RIVER WATERSHED, COMMON FEATURES, FINAL GENERAL REEVALUATION REPORT, and FINAL ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT, Sacramento District.

1. The Chief of Planning in Sacramento District requested the subject review. The District had received comments from HQUSACE in November 2015, regarding the mitigation plans for the subject project and WEST SACRAMENTO PROJECT, FINAL GENERAL REEVALUATION REPORT, AND FINAL ENVIRONMENTAL IMPACT STATEMENT /ENVIRONMENTAL IMPACT REPORT, September 2015. The District agreed with the comments and recognized that substantive revisions of the mitigation plans would be necessary. The HQUSACE comments applied to the methodology applied to the mitigation plans for the two projects. The agency technical review for both projects final general reevaluation reports and NEPA documents had been completed in September 2015. The Sacramento District contacted the Flood Risk Management Planning Center of Expertise to coordinate a targeted review.

2. The charge for the review reflected the HQUSACE comments and was summarized as verifying that mitigation plan revisions were consistent with the Water Resources Development Act of 2007, Section 2036. Because the methodology was the same for the two projects, the review document would be the subject project mitigation plan. The applicable mitigation plan revisions would be made by the District for both projects.

3. The revised mitigation plan was reviewed by Mr. Michael R. Scuderi, CENWS. Mr. Scuderi provided five technical comments and the subsequent sixth comment concluded that District evaluations and mitigation plan revisions had adequately addressed his comments. In general, the technical comments suggested additional discussion be added to more clearly present the mitigation plan.

4. The targeted review is complete. Mitigation plans for both projects have been revised. No further action by the District is required for agency technical review. A report of all comments is enclosed for the subject project.

District.

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Marc L. Masnor
ATR Team Lead

West Sacramento GRR

Appendix B

Review Documentation

Independent External Peer Review

(IEPR) Documentation

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Final Comment Response Record for the Independent External Peer Review (IEPR) of the West Sacramento Project, California, General Reevaluation Report (GRR) Flood Risk Management (FRM) Project

Prepared by

Battelle
505 King Avenue
Columbus, Ohio 43201

February 3, 2015

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Final Panel Comment 1

The project benefits are overestimated because the probability of geotechnical failure used in the HEC-FDA analyses is unreasonably high.

Basis for Comment

The computed probabilities reported in Section 14.2 of Appendix C (Geotechnical Appendix) to the GRR, which often exceed 90%, are for "poor performance" of levee reaches. While the Panel agrees that the probability of poor performance in a design flood is indeed very high, this value is not the probability of failure. The GRR describes the probabilities incorrectly (p. 2-12), representing them as the probability of failure. As a result, the failure probabilities described in the GRR are unreasonably high. These probabilities are then incorporated into the HEC-FDA analyses, resulting in an overestimate of project benefits.

One reason that the probability of poor performance significantly exceeds the probability of failure is that the risks associated with seepage constitute a large portion of the total risk of poor performance. As stated in Section 26 (p.26-1) of the recent joint work on Best Practices by USACE and the U.S. Bureau of Reclamation (USBR, 2012), internal erosion is "a potential failure mode that cannot be completely analyzed using numerical formulae or models." Thus, although seepage gradients that exceed standard criteria are a reasonable indication of potential poor performance, they are not an accurate or reasonable measure of the probability of failure.

The probability of a levee breach due to slope instability is also not the same as the probability of poor performance. Not every slope failure inevitably leads to a levee breach. Some failures are only maintenance issues; in other cases active intervention can prevent a downstream failure from developing into a levee breach.

In addition to the analytical challenges of estimating failure probability, the computed probabilities reported in Appendix C (Section 14.2) do not appear to consider the potential risk reduction through intervention by active flood fighting measures. While significant risks of failure remain even with intervention, completely ignoring the benefit overstates risk. The Best Practices work (USBR, 2012) states (pp. 35-37) that "the USACE approach is to evaluate and communicate the potential risk reduction that can be achieved with intervention while at the same time to not mask the seriousness of a potential dam safety issue by relying on intervention to reduce the risk." The analysis conducted for the GRR is inconsistent with this approach because it ignores intervention.

The GRR also does not address the degree of uncertainty associated with estimated probabilities. Best Practices (USBR, 2012) states (p.26-1) that "…risk estimating procedures, although quantitative, do not provide precise or accurate numerical results. The nature of the risk evaluation should be advisory and not prescriptive." In assessing the uncertainty associated with probability estimates, consideration should be given to a general calibration provided by Christian and Baecher (2011) when they indicate that one of the 10 major questions regarding geotechnical risk and reliability is "why failures are less frequent than reliability studies predict." They state that predicted failure frequencies are an order of magnitude larger than observed, and two orders of magnitude larger than the frequency of modes of failure for earth dams. An understanding of the relatively imprecise nature of probabilities estimated for geotechnical events is required so that decisions to fund projects can be made with an appropriate "knowledge of the degree of reliability of the estimated benefits and costs and of the effectiveness of alternative plans," specifically

required by ER 1105-2-100 (USACE, 2000).

Significance – High

Inaccurate geotechnical probabilities in the HEC-FDA analyses result in an overstatement of without-project costs that could be significant and affect the benefit-cost-ratio. Providing calculations of failure probabilities without a description of the degree of reliability of those calculations is inconsistent with policy described by ER-1105-2-100 (USACE, 2000).

Recommendation for Resolution

1. Estimate geotechnical failure probabilities using a semi-quantitative risk analysis conducted in accordance with USBR (2012). It may be necessary to use expert elicitation to establish a conditional probability relationship between poor performance and levee breach. Case history data may also be informative.
2. Revised failure probabilities should include an assessment of the uncertainty in those probabilities to comply with USACE (2000), Section 10. For example, perform sensitivity studies (such as the example provided in USBR [2012], Section 12) to assist in estimating the uncertainty in calculated failure probability that results from uncertainty in input distributions.

PDT Final Evaluator Response (FPC#1):

_X_ **Concur** ___ **Non-Concur**
The estimate of geotechnical failure probabilities were established according to state of practice for the USACE at the time of the analysis by following Corps guidance (ETL 1110-2-556). ETL 1110-2-556 has not been replaced; even though it has been "expired" for several years. Conditional probabilities were established by conducting an Expert Elicitation which is included as Enclosure 5 of the Geotechnical Appendix.

While developed following USACE guidance it is acknowledged that the geotechnical probability of poor performance is conservative in their estimation of a levee failure where the protected area is now inundated. While there is not updated guidance to resolve this, there are emerging ideas from the Risk Management Center and agency wide coordination efforts with the Bureau of Reclamation."

In the risk register, SPK has documented the use of Corps Guidance (ETL 1110-2-556) to develop the levee performance curves as likely overstating the risk of inundation.

Recommendation #1: __Adopt _X_Not adopt
The estimate of geotechnical failure probabilities were established according to state of practice for the USACE at the time of the analysis by following Corps guidance (ETL 1110-2-556). ETL 1110-2-556 has never been replaced, so even though it has been "expired" for several years, Corps Districts still use it for Feasibility Studies because new Feasibility Study fragility curve guidance has not been issued. Conditional probabilities were established by conducting an Expert Elicitation which is included as Enclosure 5 of the Geotechnical Appendix.

Recommendation #2: __Adopt _X_Not adopt
The failure probabilities were developed following the current USACE state of practice as defined in ER 11105-2-101 and ETL 1110-2-556 and did not incorporate a direct uncertainty within the probabilities. During the Expert elicitation process for judgment bases probabilities a range was assigned for each category. For probabilities associated with underseepage, through seepage, and stability analyses, a coefficient of variation is prescribed to each parameter. Those parameters were then varied independently resulting in a probability of poor performance for each of the aforementioned categories.

Further evaluation of the uncertainty in the geotechnical performance uncertainty is beyond the requirements of a feasibility study level of analysis.

Panel Final BackCheck Response (FPC#1):

Concur.

Literature Cited:

USACE (2000). Planning – Planning Guidance Notebook. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineer Regulation (ER) 1105-2-100. April 22. Available online at http://planning.usace.army.mil/toolbox/library/ERs/entire.pdf

USBR (2012). Best Practices in Dam and Levee Safety Risk Analysis. A Joint Publication by U.S Department of Interior, Bureau of Reclamation and U.S. Army Corps of Engineers; 3 December. Available online at:
http://www.usbr.gov/ssle/damsafety/Risk/methodology.html

Christian, J.T. and Baecher, G.B. (2011). Unresolved problems in geotechnical risk and reliability. Geo-Risk 2011:50-63.

Final Panel Comment 2

Potential FRM benefits have not been evaluated and project benefits are likely to be significantly greater than presented in the GRR.

Basis for Comment

The GRR does not address potential FRM benefits the project could reasonably be expected to provide. Reductions in the following costs/damages are likely to result from the project, but are not accounted for in the economic analysis.

- Emergency costs
- Agricultural flood damages associated with crops
- Damages associated with future intensification of land uses in West Sacramento.

Emergency costs would include Federal, state, and local government emergency measures, evacuation and subsistence costs, reoccupation costs, and commercial cleanup and restoration costs. Such costs can represent a significant portion of total damages. For example, reductions in emergency costs accounted for 10 to 15% of the total FRM benefits estimated for the Louisiana Comprehensive Master Plan for a Sustainable Coast (USACE, 2007). It is reasonable to believe that reductions in emergency costs in West Sacramento would be on a similar scale. Although less significant, another benefit category that was not addressed is agricultural crop damage. The land use map (Economics Appendix, Figure 6, p. 2-8) indicates that there is significant agriculture in West Sacramento, particularly in the South Basin.

A third benefit category that is not addressed focuses on land use. The Economics Appendix states (Section 3.3.2, p. 4-3) that the study area is considered to be fully built out and, therefore, expected annual damages are equal to equivalent annual damages. However, the following factors indicate that future growth is probable:

- The land use map (Economics Appendix, Figure 6, p. 2-8) shows large areas of agriculture and open space that could be converted to higher intensity land uses.
- The GRR states that there are plans for infill development in the North Basin.
- The City of West Sacramento plans additional development in the South Basin.
- The GRR states that a 64% increase in population is projected to occur between 2007 and 2030.
- The EIS/EIR describes new development projects that are under way now and into the next 20 years.

Based on the growth that has occurred in the last 10 years in West Sacramento, it is reasonable to believe that growth will continue into the foreseeable future. This would increase future benefits of alternative plans.

Currently, the USACE budgetary guidance (USACE, 2013a) requires that a flood damage reduction project have at least a 2.5 benefit-to-cost ratio at a 7% discount rate to be included in the Administration's budget (which includes Construction General Appropriations). The benefit-to-cost ratio presented in the GRR is calculated with only a 3.5% discount rate. Therefore, based on the existing economic analysis, it is possible that even if the West Sacramento Project gets authorized, the benefit-to-cost ratio may not be adequate to qualify for Construction General Appropriations.

Significance – Medium/High

Including the additional sources of project benefits (reductions in emergency costs and agricultural flood damages and greater reductions in flood damages resulting from future development) would provide a more accurate representation of the benefits of the project.

Recommendations for Resolution

1. Calculate FRM benefits that would be expected in West Sacramento due to reduced emergency costs and include them in the benefit-to-cost ratio.
2. Calculate FRM benefits that would result from reduced agricultural flood damages and include them in the benefit-to-cost ratio.
3. Assess future development that is likely to occur in West Sacramento and recalculate FRM benefits based on equivalent annual damages.

PDT Final Evaluator Response (FPC#2):

_X__**Concur** ___**Non-Concur**
Benefits associated with the prevention of emergency cost losses, agricultural crop damages, and potential land-use intensification (future development) have not been evaluated at this stage. The benefits associated with these categories may add to project benefits, but most likely not significantly.

Recommendation #1: _X_Adopt __Not adopt
Reduced emergency cost losses will be evaluated and factored into the net benefit and benefit-to-cost analyses for the without project conditions and the Tentatively Selected Plan (TSP). The HEC-FDA software will be used to estimate emergency cost losses and benefits. The methods and assumptions used in the Sutter Basin Feasibility Study, a study which has gone through the Civil Works Review Board (CWRB) and which also has been authorized by Congress, will be used. The prevention of emergency cost losses were not assessed during this stage of the planning process but will be assessed for the Final Report; the current project schedule and budget includes resources (time and funding) to complete an emergency cost loss evaluation for the Tentatively Selected Plan (TSP). Emergency costs were evaluated qualitatively during the plan formulation process and were determined to not impact plan selection. Depending on the method used to calculate losses, and based on information from other studies in the District, it is believed that damages/benefits associated with emergency cost loss categories could comprise anywhere between 2% to 15% of total damages/benefits.

Recommendation #2: _X_Adopt __Not adopt
A brief qualitative discussion on agricultural crop damages will be added to the economic appendix. A quantitative agricultural crop damage analysis was not completed for this study due to the relatively small amount of agricultural acreage in the study area (Figure 6). Additionally, when factoring in the chance of flooding by month (flooding is more likely to occur during the November to April time frame) in conjunction with the planting season for the various crops grown in the study area (mostly April to October), crop damages are expected to be minimal and an extremely small percentage (<1%) of the total damages.

Recommendation #3: _X_Adopt __Not adopt
A discussion regarding future population growth and floodplain management (EO 11988) will be added to the Final Economics Appendix. The reviewer is correct in noting that the land-use map (Figure 6) provided in the Economic Appendix indicates the potential for future development in the study area; it is estimated that there are approximately 3,900 acres of developable land. Future without project population growth and development were considered in terms of residual risk and EO 11988, but were not included in the economic damage analysis, as it would have little impact on project benefits and would not change NED identification, the recommended plan or economic feasibility.

Factors that led to the future without-project condition assumptions used for this study from a planning and economic standpoint were:

a) Sec 308 of WRDA 1990 (33 USC 2318) precludes USACE from justifying projects based on future development. Residual risk associated with a potential full growth scenario will be presented in the final Economic Appendix.

b) CA Senate Bill 5 will limit future development (or intensification) in the study area under future without-project conditions given that the study area would not have 0.5% ACE ("200yr") level of flood protection. According to current USACE floodplain modeling, this area would be within the 0.5% ACE ("200yr") without-project floodplain.

c) Given #2 above, any development (or intensification) that did take place would likely occur outside or with foundation heights above the mean 0.5% ACE "200yr" WSEL, meaning very infrequent damaging flooding which would be discounted to present values. The result is low equivalent annual damages which would not significantly impact plan selection or project benefits. For purposes of the economic analysis, however, the area was assumed to be "built out" so that damages/benefits associated with any future development would not be overstated.

Panel Final BackCheck Response (FPC#2):

Concur.

Literature Cited:

USACE (2013a). Army Programs: Corps of Engineers Civil Works Direct Program, Budget Development Guidance, Fiscal Year 2015. Engineer Circular (EC) 11-2-204. Department of the Army, U.S. Corps of Engineers, Washington, D.C. March 31.

USACE (2007). Economic Analysis and Consequences, Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast. New Orleans District, U.S. Army Corps of Engineers. April.

Final Panel Comment 3

Economic residual risks associated with seismic damage are not assessed.

Basis for Comment

The seismic vulnerability of levees has been assessed based on their ability to provide post-seismic flood protection, in accordance with the USACE Draft ETL 1110-2-580, Guidelines for Seismic Evaluation of Levees (not yet published). The analyses and classification in accordance with this ETL (as summarized in the Geotechnical Appendix, p. 12-3), indicates that seismic damage to cutoff walls is possible for the Bypass Levee and very likely for the West South Levee. The Panel understands that these levees do not retain water in the non-flood season, and thus the threat of loss of life only exists when a flood occurs either simultaneously or soon after a major earthquake, a relatively improbable occurrence. However, it appears that neither potential economic benefits nor residual economic risks associated with seismic damage have been fully assessed for the project.

The Geotechnical Appendix does not indicate whether the proposed project will improve seismic resistance of the levees. This would be a potential benefit to the project.

It appears that costs associated with repairing seismic damage to cutoff walls have not been estimated. Thus, the residual economic risks associated with repairing seismic damage to cutoff walls have not been assessed. In addition, no consideration appears to have been given to evaluating whether it would be cost-effective to improve the seismic resistance for the Bypass Levee and the West South Levee to reduce the risk of cutoff wall damage in a seismic event.

Significance – Medium/High

Without an estimate of the cost of repairing cutoff wall damage in a seismic event, the net benefit of the project may be overstated because the cost associated with the residual risk of seismic damage to cutoff walls has not been included in evaluating residual risk.

Recommendations for Resolution

1. Estimate the probability of levee damage due to seismic shaking, and estimate the cost of subsequent repair.
2. Based on the results of the above recommendation, consider whether it would be warranted to develop a conceptual design and cost estimates for improvements to resist seismic damage.

PDT Final Evaluator Response (FPC#3):

___Concur _X_Non-Concur

Further discussion as to the extent of detail within the O&M contingency costs to address seismic damage was discussed during the Cost Schedule Risk Analysis (CSRA) occurring the week of 17 November. It was determined through review and discussions with the technical disciplines and Emergency Operations that the same actions and activities employed after the 6.0 Magnitude Earthquake in Napa CA on August 24, 2014 would be applicable. Agencies performed the necessary inspections of the infrastructure for visible signs of damage. If there was a change in the structure's ability to perform an emergency flood fight would be initiated by state and local agencies. If the flood fight in the area exceeded the state's ability to respond, then PL 84-99 flood fight assistance could be requested through a governor's letter. Following the flood event, if necessary the request for PL 84-99 rehabilitation assistance could be requested/sought

to address the areas with damage. The U.S. Army Corps of Engineers Policy does not require consideration of PL 84-99 in the project economics. The CSRA Lead (Bill Bolte) from Walla Walla indicated that this would not be included in the O&M contingency costs.

It has been determined through additional discussions with the Subject Matter Expert in Seismic Research that the appropriate State of the Practice was applied in the development of the seismic appendix of the Draft Report in assigning the probability of a seismic event and the probability of a damaging event or one that would result in liquefaction. This being the case the Sacramento District feels any further discussion on this would fall into the realm of the PDT following current Policy and Engineering Regulations and the Panel desiring something that is beyond the sphere of the District or Divisions ability to alter.

One of the more common construction methodologies utilized involves the use of Bentonite in the construction which is self-sealing.

Recommendation #1: __Adopt _X_Not adopt
The West Sacramento GRR has evaluated the probability of levee damage due to seismic shaking as detailed in Enclosure No. 6. Development of a conceptual design and cost estimate for seismic mitigation is commonly not completed as the probability of a concurrent flood event and an earthquake occurring is considered to be quite low.

Recommendation #2: __Adopt _X Not adopt
See above.

Panel Final BackCheck Response (FPC#3):

Concur.

The Panel concurs based on the understanding that:

1. Any seismic damage to the levee cut-off wall would be repaired to re-establish the level of operational effectiveness existing prior to the seismic event, 2. the repair would be funded under PL 84-99 regardless of the magnitude of the cost, and 3. USACE policy is that PL 84-99 costs are not included in feasibility economics.

Literature Cited:

USACE Draft ETL 1110-2-580, Guidelines for Seismic Evaluation of Levees (not yet published).

Final Panel Comment 4

The conclusions regarding seismic hazards in relation to the California Seismic Hazards Mapping Act in the Draft EIS/EIR are contradicted by the results of analyses presented in the Geotechnical Appendix to the GRR.

Basis for Comment

The Draft EIS/EIR (p. 408) indicates that "the California Seismic Hazards Mapping Act of 1990 (California Public Resources Code [PRC] Sections 2690–2699.6) addresses seismic hazards other than surface rupture, such as liquefaction and induced landslides. The Seismic Hazards Mapping Act specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils." The Draft EIS/EIR then concludes that because the closest active fault is 35 miles to the northwest, there are no significant issues due to seismicity. However, the seismic assessment presented in Geotechnical Appendix (p. 12-3) indicates that some sections of the levee have medium to high vulnerability, placing the Sacramento River West South Levee in a classification associated with seismically induced flow slides. This is consistent with the Panel's belief that a distance of 35 miles from an active fault is insufficient to conclude that no significant issues exist due to seismicity. Thus, the project as currently proposed appears out of compliance with the Seismic Hazards Act because seismic hazards exist, and no mitigation measures are incorporated to reduce them. If the lead agency withholds development permits until mitigation measures are incorporated, these additional measures could incur significant additional costs, possibly reducing the net project benefit.

The seismic risk is also described inconsistently elsewhere in project documents. The Draft EIS/EIR states (p. 67, second paragraph) that a 200-year seismic event could very likely compromise the levee at several locations due to lateral spreading. However, in the next paragraph, the report states that "because the expected magnitude of ground shaking from large regional earthquakes is relatively low in the project area, the potential for failure or significant damage of project structures is low." The analyses in the Geotechnical Appendix indicate that the expected magnitude of ground shaking is likely to result in significant damage to some levee reaches. The statements are contradictory and the analyses described do not support the latter statement.

Significance – Medium

The conclusions regarding seismic hazards in relation to the California Seismic Hazards Mapping Act are inaccurate. If mitigation measures were deemed necessary to obtain a development permit in accordance with the Act, the costs incurred would reduce net project benefit. Furthermore, inconsistent descriptions of the potential for cutoff wall damage due to seismic events could affect the understanding and accuracy of the project.

Recommendations for Resolution

1. Clarify the discussion of seismic hazards presented in the Draft EIS/EIR (p. 67).
2. Review the conclusions related to the California Seismic Hazards Mapping Act in light of other descriptions of seismic risks (i.e., p. 67 of the EIS/EIR and the GRR, Appendix C, Section 12) and resolve any inconsistency. (The Panel does not have expertise to recommend action required for

compliance with the Act.)

PDT Final Evaluator Response (FPC#4):

_X_**Concur** ___**Non-Concur**
The Corps will ensure that the Seismicity section in the EIS/EIR and the Geotechnical Appendix are consistent.

Recommendation #1: _X_Adopt __Not adopt
The Corps will update the discussion of seismic hazards in the EIS/EIR to be consistent with the Geotechnical Appendix.

Recommendation #2: _X_Adopt __Not adopt
The Corps will resolve the inconsistency in the seismic risk discussion, review conclusions related to the Act and update the EIS/EIR to ensure compliance with the Act.

Panel Final BackCheck Response (FPC#4):

Concur.

Final Panel Comment 5

Decisions to upgrade the levee are sometimes based on qualitative criteria that are not clearly defined, potentially resulting in non-essential levee upgrades.

Basis for Comment

Recommendations regarding whether to upgrade a levee do not consistently rely on analyses and stated design criteria (e.g., exit gradient). Sometimes they are based either on qualitative criteria such as reported seepage and stability problems in a reach or engineering judgment. Because the criteria are unclear, it is not possible to evaluate whether resulting recommendations for levee improvement are essential.

Specific examples from the Geotechnical Appendix where design criteria do not support recommended actions are:

- A shallow cutoff wall is recommended for the North Basin -- Sacramento South Bypass Levee on p. 11-8, apparently to address low calculated stability. However, no analyses were performed for the with-project results.
- Although analyses indicate seepage gradients meet design criteria, a cutoff wall is recommended for the North Basin – Sacramento West Levee on p. 11-10 to "provide continuity to adjoining project reaches as well as mitigate against potential defects in the blanket layer."
- A cutoff wall is recommended for the South Basin – Port South Levee on p. 11-14, even though without-project conditions meet design criteria. The justification is related to soil conditions and historic seepage concerns.
- No analyses are reported to support the recommendation on p. 11-13 that no mitigation measures should be constructed for the southern 75% of the South Basin – Deep Water Ship Channel West Levee.
- A cutoff wall is recommended for the South Basin – Yolo Bypass East Levee on p.11-19, even though seepage criteria are met for without-project conditions.

While the Panel values engineering judgment, it is unclear whether the qualitative criteria used to justify the recommendations are appropriate, cost effective, and consistently applied. Recommended repairs using this justification may not be necessary or cost effective. Including them in the project may add cost without adding corresponding benefits, thus reducing the net benefits from the project.

Significance – Medium

Upgrades that have been recommended based on unclear criteria may be non-essential to the levee, and thus would decrease the net project benefit.

Recommendation for Resolution

1. Evaluate whether qualitative design criteria could be established and described to supplement the quantitative criteria.
2. Perform additional investigations and analyses in future design stages to resolve inconsistencies between observed performance and results of analyses.

PDT Final Evaluator Response (FPC#5):

__X__**Concur** ___**Non-Concur**
Evaluate whether qualitative design criteria could be established and described to supplement the quantitative criteria, the recommendation had transposed "qualitative" and "quantitative".

Additional analyses will be completed in future design stages as to resolve potential discrepancies within the analyses results completed during the feasibility level design process. Design criteria established for use during the study is of a quantitative nature. Increased levels of analysis to included finite element modeling with information obtained from further, more extensive exploration and laboratory testing programs, will serve to provide an improved level of concurrence between design considerations and past performance history.

Recommendation #1: ___Adopt __X__Not adopt
Establishment of a qualitative design criteria was considered in response to the recommendation and would potentially be evaluated during the design phase of the project. At the current status, the level of analyses performed and methodology employed follows USACE state of practice for feasibility level studies. The Corps Planning Modernization initiative states in part:, the approach to level of detail, data collection, and models throughout the process must be based on what is necessary to conduct and deliver that feasibility study. The expense and time of collecting more data, developing a new model, or analyzing multiple alternatives to a high level of detail must be justified, rather than assumed.

Recommendation #2: __X__Adopt ___Not adopt
Additional analyses will be completed in future design stages as to resolve potential discrepancies within the analyses results completed during the feasibility level design process.

Panel Final BackCheck Response (FPC#5):

Concur.

Final Panel Comment 6

The adequacy of the internal water management system and the incremental costs and benefits of improving the system have not been evaluated.

Basis for Comment

In order to provide flood protection to West Sacramento, it is necessary to operate and maintain a system of canals, control structures, and pump stations. Even if the Federal levee system withstands high river and bypass flows, there could be flooding in West Sacramento if the internal water management system does not function properly during a large storm event. If the internal water management system fails under such conditions, the benefits of the recommended plan would be reduced. In other words, the Federal expenditures on making improvements to the levee system will not produce the desired benefits without proper functioning of the local system. No analyses of the adequacy of the internal water management system or its operation and maintenance were performed.

The internal water management system is designed for the 1% ACE (annual chance exceedance) event. No analysis was performed to evaluate the incremental costs and benefits of improving the system to provide a greater level of protection, similar to the Federal project (i.e., maximize the net benefits). Therefore, it is possible the full extent of potential net benefits will not be realized without evaluating the incremental costs and benefits of improvements to the internal system.

Significance – Medium

Without an analysis of the design and operation and maintenance practices of the West Sacramento internal water management system, it is not possible to assess whether the system could fail during a major flood event on the Sacramento River.

Recommendations for Resolution

1. Evaluate the design, existing condition, and operations and maintenance practices of the West Sacramento internal water management system to verify that the system is designed appropriately and will continue to function properly in the future.
2. Evaluate the incremental costs and benefits of improvements to the internal water management system to determine whether such improvements are justified and could increase the total net FRM benefits of the recommended plan.

PDT Final Evaluator Response (FPC#6):

__X__**Concur** ___**Non-Concur**

An analysis of the existing condition internal water management system was conducted earlier in the study by the local sponsor's consultant to help establish the future without project conditions.

Features or improvements to existing interior features are unlikely to be economically justified based on the enclosed basin without inflow, capacity of the existing storm drainage system, and minimal residual damages with the existing interior drainage facilities in place. There is no flooding for events up to the 200-yr and there is only shallow 1-2' ponding in a few areas. It is unlikely that annualized damages for minor flooding with events greater than 200-yr would support project features.

The selected plan does not impact the interior drainage of the basin, as we are recommending levee repairs only. The interior drainage system in West Sac Basin is an enclosed system and receives runoff only from precipitation on the basin itself. The probability of the timing of a large high water event in the Sacramento River and a large rain event in the enclosed West Sacramento Basin is very low. The rainfall event in the enclosed West Sacramento Basin would occur much earlier than the high water in the Sacramento River. The two events are also likely to occur at different times in the season as they are different hydrologic events. The large rain events in the West Sacramento basin are often the result of a smaller but more concentrated thunderstorm in late summer and early fall. The storm event causing high water in the Sacramento River is from a larger winter storm.

Per the Planning Guidance Notebook, ER 1105-2-100, App E, pg E-88 section g. "In urban and urbanizing areas provision of a basic drainage system to collect and convey local runoff is a non-Federal responsibility." The only part that would be a federal responsibility would be the pump stations that take the water over the federal flood control works and gravity drains or ponding areas, if any. For the purposes of this study, the pumps were found to be adequate for current hydrologic conditions and would only be upgraded if the levee repairs interfere with the pump operation.

Recommendation #1: _X_Adopt __Not adopt
An analysis of the existing condition internal water management system was conducted earlier in the study by the local sponsor's consultant to help establish the future without project conditions.

Recommendation #2: _X_Adopt __Not adopt
The analysis mentioned in Recommendation 1 demonstrated that the interior drainage is already adequate. A qualitative assessment was conducted and it was determined that for the purposes of this study, improvements to the existing interior drainage system is not economically justified.

Panel Final BackCheck Response (FPC#6):

Concur.

Final Panel Comment 7

The basis for the assumption that the project will receive funding for construction at a rate of $100 million per year has not been provided, and the construction period may be too short, which would result in an underestimate of the cost of interest during construction.

Basis for Comment

The cost of interest during construction is based on the estimated construction period and has a significant impact on the Total Project Cost. Table 38 (Economics Appendix, p. 4-14) shows the Project Costs of the recommended plan at $1,613,768,000. The interest during construction is $646,916,000 for a Total Project Cost of $2,259,684. The interest during construction is about 28% of the Total Project Cost.

The Economics Appendix (Section 4.7, p. 4-13) states that the construction period used to calculate interest during construction was based on an assumption that funding would be provided at a rate of $100 million per year. From the HQ-USACE web site, an examination of the FY 2014 budget justification sheets (USACE, 2013b) shows that a total of just under $120 million was included in the Construction General budget for the Sacramento District. The Economics Appendix (Section 4.7, p. 4-14) states that the construction period for the recommended plan is 17 years. Hence, the assumption that funding for the West Sacramento Project would be provided at an average rate of $100 million per year for 17 consecutive years for a single project appears to be unlikely. Assuming that the FY 2014 appropriations are typical for the Sacramento District, this would require that over 80% of the District's total Construction General budget would be devoted to a single project for 17 years.

Significance – Medium

If the assumption that an average of $100 million will be available annually for 17 consecutive years is overly optimistic, the construction period could be significantly lengthened and the cost of interest during construction would be increased.

Recommendations for Resolution

1. Add a description of the basis for the assumption that the project will receive $100 million per year during the construction period.

PDT Final Evaluator Response (FPC#7):

_X_**Concur** ___**Non-Concur**
The project team made the assumption regarding receiving $100 million per year and thought it was reasonable. Note that the $100 million per year would be split up 65% fed/35% non-fed so that the district would be receiving $65 million per year in federal funding. This simplified assumption was applied to all of the alternatives in the final array (consistentcy). This assumption would not affect plan selection. The availability of some construction equipment, such as deep soil mixing and jet grouting equipment, could impact the construction schedule.

Recommendation #1: _X_Adopt __Not adopt
The basis for the assumption will be added to the document text. A construction schedule, based on optimal funding, will be developed for the Cost Schedule Risk Analysis and the final report. In addition, the construction schedule developed for the CSRA will be used to re-calculate IDC, which will be incorporated into the net benefit and benefit-to-cost analyses.

Panel Final BackCheck Response (FPC#7):

Concur.

Literature Cited:

USACE (2013b). Fiscal Year 2014 -- Civil Works Budget Details for the U.S. Army Corps of Engineers, Volume II. Department of the Army, Office of the Assistant Secretary of the Army (Civil Works). 1 May. Available online at: http://www.usace.army.mil/Portals/2/docs/civilworks/budget_just/just_2014_vol2.pdf

Final Panel Comment 8

The mitigation requirements for the alternatives and the recommended plan are not described in the GRR and it is not clear whether the cost estimates include the cost of implementing and monitoring mitigation measures.

Basis for Comment

Table PAC-7 (p. 11) in the GRR identifies a significant number of mitigation measures that would be required for the recommended plan, but does not describe them. The Draft EIS/EIR gives general descriptions of the mitigation measures, but the level of detail on mitigation requirements is limited. Providing a more detailed description of the proposed mitigation measures for the recommended plan would allow an assessment of their reasonableness and potential obstacles that might be encountered during implementation. More details on the mitigation measures would give confidence that the costs are reasonable, but there is no indication in the GRR whether the cost of the mitigation measures and monitoring are included in the total project cost estimate.

Significance – Medium

Providing descriptions of the mitigation measures and describing the basis for the cost estimates would strengthen the understanding of the project costs and any uncertainty that might exist in the cost estimate.

Recommendation for Resolution

1. Provide more detailed descriptions of the mitigation measures, how they will be implemented, and uncertainties related to implementation.
2. Add a discussion of how the cost estimates for mitigation measures and monitoring were developed, include a line item for mitigation measures and monitoring in the total project cost estimate, and discuss uncertainty.

PDT Final Evaluator Response (FPC#8):

__X__**Concur** ___**Non-Concur**
The final report will contain descriptions of the mitigation measures and the basis for calculation of the mitigation cost estimates.

Recommendation #1: _X_Adopt __Not adopt
The final report will provide more detailed descriptions of the mitigation measures, the manner in which they will be implemented, and any uncertainties that would be related to their implementation.

Recommendation #2: _X_Adopt __Not adopt
The final report will include a discussion of how the cost estimates for mitigation measures and monitoring were developed and the uncertainties associated with the cost estimate. The total project cost estimate will include a line item with information regarding the cost of mitigation and monitoring.

Panel Final BackCheck Response (FPC#8):

Concur.

Final Panel Comment 9

Baseline conditions for invasive plants in the project area, and an effects analysis for invasive plant spread as a result of project construction, have not been presented.

Basis for Comment

The Draft EIS/EIR does not discuss the baseline conditions for invasive plants in the project area (e.g., their presence or potential to occur) and how project implementation could result in their introduction or spread. For example, invasive plants could be inadvertently introduced or spread in the project area during construction activities if nearby source populations passively colonize disturbed ground, or if construction and personnel equipment is transported to the site from an infested area. In addition, soil, vegetation, and other materials transported to the project area from off-site sources for best management practices (BMPs), revegetation, or fill for project construction could contain invasive plant seeds or plant material that could become established in the project area.

Executive Order No. 13112 (1999), which established a National Invasive Species Council, directs all Federal agencies to prevent the introduction and control the spread of invasive species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. If significant impacts could occur, standard invasive plant management practices are available and should be considered as part of the project design or mitigation. However, the Draft EIS/EIR does not present an effects analysis of invasive plant spread as a result of project construction.

Significance – Medium

The Draft EIS/EIR is not clear whether the effects related to invasive plants have been adequately evaluated and, if needed, mitigated.

Recommendation for Resolution

1. Discuss existing conditions for invasive plants/noxious weeds in the project area. If recent field or other site-specific data to characterize invasive plant conditions in the project area are not available, then a summary of the expected or likely conditions there based on land cover types, levels of disturbance, and known invasive plant occurrences in nearby areas would be adequate.
2. Discuss construction-related impacts in the effects analysis and consider whether mitigation to prevent invasive plant spread during construction is needed.

PDT Final Evaluator Response (FPC#9):

__X__**Concur** ___**Non-Concur**
The Corps will update the EIS/EIR to ensure that invasive plants are properly addressed in the vegetation and wildlife section.

Recommendation #1: __X__Adopt __Not adopt
The Corps will update the vegetation and wildlife section to include a discussion of existing conditions for invasive plants. This will likely consist of a summary of the expected or likely conditions, due to lack of site-specific survey data.

Recommendation #2: __X__Adopt __Not adopt
The Corps will update the vegetation and wildlife section to include the effects analysis for invasive plants. The Corps will consider what mitigation or BMPs might be implemented in order

to reduce the potential for spread of invasive plants.

Panel Final BackCheck Response (FPC#9):

Concur.

Literature Cited:

Executive Order No. 13112 (1999). Invasive Species, 64 Federal Register 6183 (February 8, 1999). Available online at http://www.gpo.gov/fdsys/pkg/FR-1999-02-08/pdf/99-3184.pdf

Final Panel Comment 10

Some biological resources in the study area potentially affected by project implementation have not been presented in sufficient detail to describe the existing conditions and support the EIS/EIR analysis.

Basis for Comment

Detailed representations of the distribution and types of land cover and other potentially affected biological resources, using graphics and/or tables, are important for describing the existing conditions and evaluating potential impacts. Section 3.6 of the Draft EIS/EIR (pp. 106-107, 120-121) references Figures 3.6-1 through 3.6-5, but they are not in the document. These figures reportedly show the distribution and types of land cover and other biological resources in the study area potentially affected by project implementation. USACE confirmed during the August 21, 2014 mid-review teleconference with the Panel (facilitated by Battelle) that these figures did not exist yet. Additionally, a table that quantifies (in acres) and compares the amount of each land cover type, including waters of the U.S., assumed to be affected under each alternative is not included in the biological resources analysis but would improve the clarity of the analysis and conclusions.

The conclusions of the biological resources analysis may be accurate; however, some of the biological resources information needed to evaluate the magnitude of effects and support the conclusions are not clearly presented in the Draft EIS/EIR.

Significance – Medium

The lack of figures that are referenced in the Draft EIS/EIR and the lack of clear quantitative comparisons of impacts among the alternatives limit the completeness and quality of the report.

Recommendation for Resolution

1. Prepare and add Figures 3.6-1, 3.6-2, 3.6-3, 3.6-4, and 3.6-5 to the Draft EIS/EIR.
2. Add a table that quantifies (in acres) and compares the amount of each land cover type, including waters of the U.S., assumed to be affected under each alternative.

PDT Final Evaluator Response (FPC#10):

_X__**Concur** ___**Non-Concur**
The Corps will update the EIS/EIR to include the recommendations discussed below.

Recommendation #1: _X_Adopt __Not adopt
The Corps will ensure that the vegetation and wildlife section includes habitat maps of the study area. These figures did not exist for the draft but will be prepared and included in the final report.

Recommendation #2: _X_Adopt __Not adopt
The Corps has prepared tables identifying habitat acreages impacted by the project. These tables will be included in the final report.

Panel Final BackCheck Response (FPC#10):

Concur.

Final Panel Comment 11

Issues that are important to the integrity of the levee that may affect its future performance (such as poor soil composition, presence of any large trees at or near the levee, and the likelihood of animals burrowing the soil) have not been fully addressed.

Basis for Comment

As the nation's levee system continues to grow older and the risk to public health and safety grows along with it, levee owners and operators can greatly mitigate these risks by implementing a basic protection/maintenance plan of levees. Issues that concern levee stability include poor soil settlement and erosion over time, presence of trees larger than 2 inches in diameter at or near the levee, and the continuous, natural activity of animal burrowing within the levee. Burrows that are created by animals can cause great damage to the integrity of levees and can often lead to rapid levee failures during times of flood. Therefore, some consideration must given to these conditions that occur at or near the levee.

The GRR acknowledges that poor soil composition is an issue (p. 1-19, Section 1.5.1.4) and the soil does not meet today's engineering standards. The GRR (Sections 2-10 to 2-12 and 4-3) does not fully address the size of the trees on or near the levee, riprapped areas, or drainage channels that would pose a problem. In addition, the GRR does not fully address an animal abatement program or control techniques that should be put in place. The presence of burrowing animals may not be readily detected without conducting a thorough inspection or putting in place control techniques such as bait stations, trapping, or removal of animals (in the case of beavers).

Since these issues could be a problem for future levee owners and operators, the diameter of the trees posing a problem should be specified and specific control techniques should be stated to address the issue of burrowing animals. Treatment of the soil (if possible), removal of oversized trees (larger than 2 inches in diameter) that pose a problem to the levee, and detection of the activities of burrowing animals is crucial to the integrity of the levee. If these issues are addressed and actively monitored, the levee is expected to perform well. By understanding that no single plan can guarantee that a levee system will not fail under all circumstances, levee owners and operators are encouraged to work with local public safety officials in assisting them to develop effective protection/maintenance plans. One of the most important links in the "safety chain" of flood risk management is, indeed, the protection of levees.

Significance – Medium

Without addressing issues that play a factor in levee stability (e.g., poor soil composition of the levee, presence of large trees at or near the levees, and the likelihood of animals burrowing the soil), it is not possible to assess the future performance of the levee.

Recommendation for Resolution

1. Implement an active abatement or control program to remove any animals or large trees that are located at or near the levees.

PDT Final Evaluator Response (FPC#11):

__X__**Concur** ___**Non-Concur**

The levees will be brought into compliance with USACE levee safety policy during design and construction of the Tentatively Selected Plan. The local maintaining agency is responsible for maintenance of the

levees following construction. The Operations and Maintenance manual developed for the project will include an active abatement and control program to remove any animals or large trees that are located near the levee and present a risk to the functionality of the levee.

Recommendation #1: _X_Adopt __Not adopt
The O&M manual will include an abatement and control program for borrowing animals and removal of vegetation.

Panel Final BackCheck Response (FPC#11):

Concur.

Literature Cited:

USACE (2006). Levee Owner's Manual for Non-Federal Flood Control Works. The Rehabilitation and Inspection Program, Public Law 84-99. U.S. Army Corps of Engineers. March. Available online at: http://media.swf.usace.army.mil/pubdata/ppmd/emermgt/pdf/leveeownersmanual.pdf

Final Panel Comment 12

A strategy has not been presented for allocating costs and benefits for West Sacramento alternatives that might be integrated with the Locally Preferred Option being considered in the American River Common Features Project.

Basis for Comment

The GRR states (Section 3.12.2, p. 3-26) that widening the Sacramento Weir and Bypass is being carried forward as part of the Locally Preferred Option (i.e., the alternative that is preferred by the non-Federal sponsor) in the American River Common Features Project. Implementation of these measures would preclude the need to raise portions of the West Sacramento levees along the Sacramento River. The West Sacramento GRR also indicates (Section 3.12.4, p.3-28) that the costs of widening the Sacramento Weir and Bypass could be "cost shared" between the two projects. However, the West Sacramento GRR does not present a strategy for how to allocate the total costs between the projects. If the costs of widening the Sacramento Weir and Bypass are shared between the two projects, it would be reasonable for the benefits that result from the costs to also be shared. Care must be taken to account for and allocate all benefits and costs, but avoid double-counting costs or benefits. Additionally, with two different non-Federal sponsors, a cost sharing strategy is needed.

Significance – Medium/Low

Without presenting a strategy for allocating the costs and benefits between the American River Common Features and the West Sacramento Projects, it will not be possible to determine the full benefits and costs of alternative plans for both projects, which may impact the benefit-to-cost ratios of alternatives for both projects.

Recommendations for Resolution

1. Develop and apply a strategy for allocating costs and benefits to the American River Common Features Locally Preferred Option and the West Sacramento Project alternatives, assuming both projects are authorized.
2. Assess and document the non-Federal sponsors' willingness to participate in plans that integrate the American River Common Features Locally Preferred Alternative with the West Sacramento recommended plan.
3. Develop strategies for the West Sacramento Project based on future scenarios with and without authorization and construction of the American River Common Features Project.

PDT Final Evaluator Response (FPC#12):

_X_**Concur** ___**Non-Concur**

Please note - The text on page 3-28 will be revised to remove the mention of "cost sharing."

Neither the costs nor the benefits of the West Sacramento GRR and the American River Common Features GRR are shared. There are not any features of the two projects that have shared costs. Each project is a stand-alone project.

West Sacramento GRR Alternatives 2 and 4, which included the Sacramento Bypass widening, were not carried into the final array of alternatives, because they were not as cost effective as other alternatives.

The District determined that because there is a limited amount of levee raising (approximately 5,000 ft. of levee) needed along the Sacramento River for the West Sacramento project, the more efficient option was to raise the levees in place to address that concern.

Recommendation #1: __Adopt _X_Not adopt
See explanation above

Recommendation #2: __Adopt _X_Not adopt
Not applicable based on reasons presented above

Recommendation #3: _X_Adopt __Not adopt
The West Sacramento and ARCF projects are stand alone projects. A hydraulic analysis including the future with project conditions for both projects has been conducted to verify that the projects can be implemented on their own.

Panel Final BackCheck Response (FPC#12):

Concur.

Final Panel Comment 13

It is not clear how evaluation metrics were used in screening preliminary alternatives or evaluating the final alternatives.

Basis for Comment

Table 3-18 of the GRR (p. 3-35) provides a set of evaluation metrics that could be used to assess how well alternatives meet the planning objectives. However, there is no description in the GRR of how the evaluation metrics were applied and how they were used to screen or compare alternatives. Nor does the GRR describe how the alternatives were uniformly evaluated using a common set of evaluation metrics.

Significance – Medium/Low

A clear description of how the alternatives were evaluated is necessary to determine how well they met the planning objectives.

Recommendations for Resolution

1. Provide a description of how the evaluation metrics in Table 3-18 were applied to the alternatives and how the alternatives compared. A table could be added to compare how well each alternative met the planning objectives based on the evaluation matrix.

PDT Final Evaluator Response (FPC#13):

_X_**Concur** __**Non-Concur**

A table will be created and included in the final report that compares the preliminary array of alternatives to the evaluation metrics. Narrative will be added for further description.

Note that Table 3-20 – Screening of Preliminary Array of Alternatives - includes a column Effectiveness (Meets Objectives) that presents information regarding screening. With the exception of alternatives 0.5A, 0.5B, and 0.5C the preliminary alternatives meet the objectives for the most part. An explanation of the major reason the alternative did not meet the objective is included in the table.

Recommendation #1: _X_Adopt __Not adopt

A table will be created and included in the final report that compares the preliminary array of alternatives to the evaluation metrics. Narrative will be added for further description.

Panel Final BackCheck Response (FPC#13):

Concur.

Final Panel Comment 14

It is not clear how the magnitude of impacts and level of significance were determined for effects of sedimentation and turbidity on fisheries resources.

Basis for Comment

The Draft EIS/EIR (Section 3.7, pp. 131-135) concludes that an increase in sedimentation and turbidity could be considered significant for fisheries in general; however, the specific types and magnitude of these effects under each alternative are not described.

In terms of the specific significance criteria used for fisheries resources (Draft EIS/EIR, p.129), it is not clear how the level of significance was determined. For example, it is not clear what assumptions were made about the amount of increased sedimentation and turbidity that would be considered substantial and therefore significant.

Significance – Medium/Low

Without a discussion of the magnitude of impacts on fisheries resources relative to baseline conditions, the quality and completeness of the analysis are limited and the biological rationale to support the conclusions is not clear.

Recommendation for Resolution

1. Expand the discussion of anticipated project effects on fisheries resources. The discussion should describe impact mechanisms and the types and magnitude of biological effects.

2. Discuss the assumptions made about the amount of project-related increased sedimentation and turbidity (relative to baseline conditions) that would be considered substantial and therefore significant. If any amount of increase is considered significant, then clarify that point.

PDT Final Evaluator Response (FPC#14):

_X_**Concur** __**Non-Concur**
The Corps will update the EIS/EIR to include the recommendations discussed below.

Recommendation #1: _X_Adopt __Not adopt
The Corps will ensure that the fisheries section includes impact mechanisms and the types and magnitude of biological effects. These analyses will be prepared and included in the final report.

Recommendation #2: _X_Adopt __Not adopt
The Corps will ensure that the fisheries section includes a discussion regarding the assumptions that were made about project-related increased sedimentation and turbidity (relative to baseline conditions). The significance criteria will be clarified.

Panel Final BackCheck Response (FPC#14):

Concur.

Final Panel Comment 15

Details about dates, locations, and objectives of reconnaissance-level surveys for some biological resources are not presented.

Basis for Comment

Sections 3.6 and 3.8 of the Draft EIS/EIR (pp. 107, 137, 150, 151, 167) mention that reconnaissance-level surveys to characterize existing biological resource conditions and analyze project-related impacts were conducted. The Panel believes they are likely appropriate to support the analysis. However, no information is provided about the methodology and timing of the surveys, or the types of information collected (e.g., vegetation mapping, evaluating habitat suitability for special-status species, etc.). Section 3.7 of the Draft EIS/EIR does not mention whether reconnaissance-level or other surveys for fisheries resources were conducted.

Significance – Medium/Low

The overall quality and adequacy of the reconnaissance-level surveys cannot be evaluated without some additional detail about the timing, objectives, and methods of the surveys.

Recommendation for Resolution

1. Provide a discussion of the survey methods, including survey areas, dates, and types of information collected in Sections 3.6, 3.7, and 3.8 of the Draft EIS/EIR.

PDT Final Evaluator Response (FPC#15):

_X_**Concur** ___**Non-Concur**
The Corps will update the EIS/EIR to include details on what surveys have been conducted at this time. Surveys have not been completed for the full project area. The Corps will clarify where the surveys occurred and where the Corps used GIS data and aerials in order to estimate potential impacts to habitat types.

Recommendation #1: _X_Adopt __Not adopt
The Corps will update the listed sections to include details on what surveys have been conducted at this time. Surveys have not been completed for the full project area. The Corps will clarify where the surveys occurred and where the Corps used GIS data and aerials in order to estimate potential impacts to habitat types.

Panel Final BackCheck Response (FPC#15):

Concur.

Final Panel Comment 16

No analyses have been reported that confirm that the seepage model extent is sufficient so that boundary effects do not result in inaccurate results.

Basis for Comment

As described in the Geotechnical Appendix, Section 11.1, no-flow boundary conditions were applied at the downstream extent of the seepage model used to determine exit gradients and evaluate whether seepage control measures are required. The boundary conditions are unlikely to represent actual conditions because some landward flow probably exists. The Panel infers that it was assumed that the numerical seepage model extent of 2000 ft described in Section 11.1 is large enough that boundary conditions will not affect the results near the levee. No information is provided whether any analyses have been conducted to confirm this assumption. Instead of no-flow boundary conditions, an option would be to use a constant head boundary based on assumed groundwater conditions on the landside boundary of the seepage model.

Significance – Low

Confirming that boundary conditions used for seepage analyses do not result in inaccurate results will improve the understanding and accuracy of the project.

Recommendation for Resolution

1. The inferred assumption should be confirmed in future design phases either by analyzing a few cases with larger model extents and comparing results to confirm that exit gradients are the same, or by applying constant head boundary conditions on vertical surfaces with reasonably assumed piezometric levels.

PDT Final Evaluator Response (FPC#16):

__X__**Concur** ___**Non-Concur**
The inferred assumption regarding boundary conditions will be confirmed in future design phases.

Recommendation #1: __X__Adopt ___Not adopt
During future design phases analyses incorporation of more robust model extents (i.e. extension of the landside extent of the model past 2000ft from the landside levee toe, or by assigning applicable vertical head boundary conditions) will allow for a comparison of results to confirm consistency in exit gradients.

Panel Final BackCheck Response (FPC#16):

Concur.

Final Panel Comment 17

The use of effective peak shear strength parameters may not be appropriate for all materials.

Basis for Comment

The strength parameters used for concept level analyses are appropriate for the vast majority of the project; however, it is possible that in a few cases the risk of slope instability is somewhat higher than present calculations indicate. Stability analyses used effective shear strength parameters for all materials and were determined using the 33% percentile value from either in situ tests or triaxial tests. While the method is appropriate for the majority of the soils encountered for the proposed project, special cases exist where performing analyses using undrained or fully softened parameters might reduce calculated stability for both with- and without-project conditions. Using effective stress parameters is not appropriate for soft to medium stiff foundation clays and silty clays that generate positive pore pressure during shear, unless sophisticated and unusual methods are used to determine these pore pressures. Stability analyses of such materials are appropriately performed using undrained strength, as described by Ladd (1986).

Using strength determined from in situ and triaxial tests may be unconservative for fat clays, even using the 33% percentile value. This is especially true when subjecting the materials to alternating cycles of wetting and drying. For these materials, Duncan and Wright (2005) summarize research demonstrating that the fully softened strength is more appropriate for these materials. In situ tests and standard triaxial testing provide peak strength, not fully softened strength. Duncan and Wright discuss appropriate lab testing methods, and provide correlations for estimating appropriate strengths.

The Panel believes that in a few cases the use of undrained or fully softened strength parameters may overestimate both with- and without-project condition level slope stability. Reanalyzing the slopes with more appropriate parameters could increase both the cost of levee repair, but also the likelihood of failure for without-project conditions, thus increasing the benefit of the project. As a result, any changes in the benefit-to-cost ratio are almost certainly within the margin of uncertainty for the project.

Significance – Low

Using undrained or fully softened strength parameters will improve the accuracy and technical quality of the project, notably in the future design phase.

Recommendation for Resolution

1. During future design phases, evaluate whether conditions exist where using undrained or fully softened strength parameters might affect details of recommended repairs. If necessary, perform lab tests or use applicable correlations to determine appropriate strength parameters for use in detailed design.

PDT Final Evaluator Response (FPC#17):

_X_**Concur** ___**Non-Concur**
The use of effective peak shear strength parameters may not be appropriate for all materials. The parameters will be evaluated during future design phases.

Recommendation #1: _X_Adopt __Not adopt
During future design phases, evaluation of whether conditions exist that may warrant an undrained of fully

softened shear strength case will be considered. This evaluation will be done in conjunction with future design level laboratory testing program to allow for a more defined definition of the shear strength parameters.

Panel Final BackCheck Response (FPC#17):

Concur.

Literature Cited:

Duncan, J. Michael and Wright, Stephen G. (2005). Soil Strength and Stability. John Wiley and Sons Inc., 312 pp.

Ladd, C.C. (1986). Stability evaluation during staged construction. ASCE Journal of Geotechnical Engineering, 1986:117(4)

Final Panel Comment 18

The level of significance of impacts on biological resources after mitigation is not clearly presented.

Basis for Comment

The Panel believes the overall conclusions of the analysis of the impacts on biological resources may be accurate, and the biological effects of implementing and operating the project with mitigation incorporated could be relatively minor. However, the biological rationale and evidence to support the conclusions are not always consistent or clearly presented. Clear presentation of this information is important for supporting the analysis, conclusions, and whether proposed mitigation is adequate.

Table ES-1 of the Draft EIS/EIR (pp. ES-13 to 20) summarizes the environmental effects, mitigation, and levels of significance for each alternative. In the "Vegetation and Wildlife" category, all the effects are listed as "significant" (with mitigation incorporated); however, the analysis in Section 3.6 (pp. 114-121) describes the effects as being reduced to a less-than-significant level with mitigation incorporated. The same issue applies to Table 4-2 (p. 392).

The cumulative effects analyses for vegetation and wildlife, fisheries resources, and special-status species (Draft EIS/EIR, pp. 384-387) do not describe or provide a rationale for whether the project's contribution to a cumulative effect is considered significant.

The mitigation proposed for impacts on special-status bat species states (Draft EIS/EIR, p. 182): "The same measures described above for migratory bird species would also be used to minimize the effects to bats." However, because survey techniques and timing for detecting migratory birds are different than those for detecting bat species, the measures proposed for migratory birds would not likely be appropriate for detecting and minimizing/avoiding impacts on bats.

Significance – Low

The biological rationale and evidence to support the conclusions of the analysis of impacts on biological resources are not consistent or clearly presented, which limits the completeness and technical quality of the Draft EIS/EIR.

Recommendation for Resolution

1. For the biological resources impact discussions presented in Sections 3.6, 3.7, and 3.8 of the Draft EIS/EIR (pp. 114-124, 131-135, 168-185), include a conclusion about whether all potentially significant effects have been reduced to a less-than-significant level, and which (if any) have not. (For consistency, this revision could be made to all of the resource sections.)
2. Review and, if needed, revise Tables ES-1 and 4-2 to make them consistent with the analysis conclusions for biological resources.
3. Provide details of the proposed mitigation for impacts on special-status bat species (e.g., survey methods, limited operating periods, minimization/avoidance measures, etc.).
4. Expand the cumulative effects discussion (pp. 384-387) to include a discussion of the project's contribution to a cumulative effect and its level of significance. (For consistency, this revision could be made to all of the resource sections.)

PDT Final Evaluator Response (FPC#18):

_X__**Concur** ___**Non-Concur**
The Corps will update the EIS/EIR to include the recommendations discussed below.

Recommendation #1: _X_Adopt __Not adopt
A conclusion will be added to the biologic resource impact discussions in Section 3.6, 3.7, and 3.8 of the EIS/EIR regarding whether all of the potentially significant impacts have been reduced to a less than significant level.

Recommendation #2: _X_Adopt __Not adopt
Special status species section in the tables will be updated to be consistent with one another. The other resources are all consistent between the tables.

Recommendation #3: _X_Adopt __Not adopt
The Corps will update and provide additional details to the proposed mitigation measures for special-status bat species.

Recommendation #4: _X_Adopt __Not adopt
A significance determination was not made for Special Status Species or Cultural Resources. The Corps will update the cumulative effects section to ensure that an appropriate determination is made for these two resources.

Panel Final BackCheck Response (FPC#18):

Concur.

West Sacramento, California, Flood Risk Management Project
General Reevaluation Report and Impact Statement/ Environmental Impact Report

DRAFT

U.S. Army Corps of Engineers Response to
Independent External Peer Review
September 2015

Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of WRDA 2007, EC 1165-2-209, and the Office of Management and Budget's Final Information Quality Bulletin for Peer Review (2004).

The goal of the U.S. Army Corps of Engineers (USACE) Civil Works program is to always provide scientifically sound, sustainable water resources solutions for the nation. The USACE review processes are essential to ensuring project safety and quality of the products USACE provides to the American people. Battelle Memorial Institute (Battelle), a non-profit science and technology organization with experience in establishing and administering peer review panels for the USACE, was engaged to conduct the IEPR of the American River Common Features, California Flood Risk Management Project General Reevaluation Report and Environmental Impact Statement and Environmental Impact Report (EIS\EIR).

The Battelle IEPR panel reviewed the Draft General Reevaluation Report (GRR) and Draft EIS/EIR, as well as supporting documentation. The Final IEPR Battelle Report was issued in February 2015.

Overall, 18 comments were identified and documented; one was identified as having high significance, two were identified as having medium/high significance, eight had medium significance, four had medium/low significance, and three were identified as having low significance. The following discussions present the Final Response to the 18 comments.

Based on the technical content of the study documents and the overall scope of the project, Battelle identified candidates for the panel in the field of Civil Works Planning, National Environmental Policy Act (NEPA) and Biology, Hydrology and Hydraulics Engineering, and Geotechnical Engineering. Four panel members were selected for the IEPR.

1. IEPR Comment – *High Significance*. The project benefits are overestimated because the probability of geotechnical failure used in the HEC-FDA analyses is unreasonably high.

The comment included two recommendations for resolution which were not adopted as discussed below.

USACE Response (#1): Not Adopted

1. **Action Taken:** The IEPR Panel recommended **e**stimating geotechnical failure probabilities using a semi-quantitative risk analysis conducted in accordance with USBR (2012). It may be necessary to use expert elicitation to establish a conditional probability relationship between poor performance and levee breach. Case history data may also be informative. N

   Not adopted - The estimate of geotechnical failure probabilities were established according to state of practice for the USACE at the time of the analysis by following Corps guidance (ETL 1110-2-556). ETL 1110-2-556 has never been replaced, so even though it has been "expired" for several years, Corps Districts still use it for Feasibility Studies because new Feasibility Study fragility curve guidance has not been issued. Conditional probabilities were established by conducting an Expert Elicitation which is included as Enclosure 5 of the Geotechnical Appendix.

2. **Action Taken** – The IEPR Panel suggested that the revised failure probabilities should include an assessment of the uncertainty in those probabilities to comply with USACE (2000), Section 10. For example, perform sensitivity studies (such as the example provided in USBR [2012], Section 12) to assist in estimating the uncertainty in calculated failure probability that results from uncertainty in input distributions.

   Not Adopted - The failure probabilities were developed following the current USACE state of practice as defined in ER 11105-2-101 and ETL 1110-2-556 and did not incorporate a direct uncertainty within the probabilities. During the Expert elicitation process for judgment bases probabilities a range was assigned for each category. For probabilities associated with underseepage, through seepage, and stability analyses, a coefficient of variation is prescribed to each parameter. Those parameters were then varied independently resulting in a probability of poor performance for each of the aforementioned categories. Further evaluation of the uncertainty in the geotechnical performance uncertainty is beyond the requirements of a feasibility study level of analysis.

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2. IEPR Comment – *Medium/ High Significance*. Potential FRM benefits have not been evaluated and project benefits are likely to be significantly greater than presented in the GRR.

The comment includes three recommendations for resolution which were adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended to **c**alculate FRM benefits that would be expected in West Sacramento due to reduced emergency costs and include them in the benefit-to-cost ratio.

USACE Response (#2): Adopted

Action Taken: The IEPR Panel recommended calculation of FRM benefits that would result from reduced agricultural flood damages and include them in the benefit-to-cost ratio.

USACE Response (#3): Adopted

Action Taken: The IEPR panel recommended an assess of future development that is likely to occur in West Sacramento and recalculate FRM benefits based on equivalent annual damages

3. IEPR Comment – *Medium/High Significance*. Economic residual risks associated with seismic damage are not assessed.

The comment includes two recommendations for resolution which were both adopted as discussed below.

USACE Response (#1): Not Adopted

Action Taken: The IEPR panel recommended estimation of the probability of levee damage due to seismic shaking, and estimate the cost of subsequent repair. We did not adopt this recommendation based on the following: *The West Sacramento GRR has evaluated the probability of levee damage due to seismic shaking as detailed in Enclosure No. 6. Development of a conceptual design and cost estimate for seismic mitigation is commonly not completed as the probability of a concurrent flood event and an earthquake occurring is considered to be quite low.*

USACE Response (#2): Not Adopted

Action Taken: The IEPR Panel recommended that based on the results of the above recommendation, consider whether it would be warranted to develop a conceptual design and cost estimates for improvements to resist seismic damage. *We did not adopt this recommendation for the reasons stated above.*

4. IEPR Comment – *Medium Significance.* The conclusions regarding seismic hazards in relation to the California Seismic Hazards Mapping Act in the Draft EIS/EIR are contradicted by the results of analyses presented in the Geotechnical Appendix to the GRR.

The comment includes two recommendations for resolution which were all adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended clarifying the discussion of seismic hazards presented in the Draft EIS/EIR (p. 67)The IEPR panel recommended adding figures that depict biological resources within the study area, including vegetation/habitat types in relation to proposed project features.

USACE Response (#2): Adopted

Action Taken: The IEPR panel recommended review of the conclusions related to the California Seismic Hazards Mapping Act in light of other descriptions of seismic risks (i.e., p. 67 of the EIS/EIR and the GRR, Appendix C, Section 12) and resolve any inconsistency.

5. IEPR Comment – *Medium Significance.* Decisions to upgrade the levee are sometimes based on qualitative criteria that are not clearly defined, potentially resulting in non-essential levee upgrades.

The comment includes two recommendations for resolution which were all adopted as discussed below.

USACE Response (#1): Adopted

1. **Action Taken:** The IEPR panel recommended evaluating whether qualitative design criteria could be established and described to supplement the quantitative criteria.

USACE Response: (#2) Adopted

2. **Action Taken:** The IEPR panel recommended performing additional investigations and analyses in future design stages to resolve inconsistencies between observed performance and results of analyses.

6. IEPR Comment – *Medium Significance.* The adequacy of the internal water management system and the incremental costs and benefits of improving the system have not been evaluated.

The comment includes two recommendations for resolution which were all adopted as discussed below.

USACE Response (#1): Adopted

1. **Action Taken:** The IEPR panel recommended evaluating the design, existing condition, and operations and maintenance practices of the West Sacramento internal water management system to verify that the system is designed appropriately and will continue to function properly in the future.

USACE Response (#2): Adopted

2. **Action Taken:** The IEPR panel recommended evaluating the incremental costs and benefits of improvements to the internal water management system to determine whether such improvements are justified and could increase the total net FRM benefits of the recommended plan.

7. IEPR Comment – *Medium Significance.* The basis for the assumption that the project will receive funding for construction at a rate of $100 million per year has not been provided, and the construction period may be too short, which would result in an underestimate of the cost of interest during construction.

The comment includes one recommendation for resolution which was adopted as discussed below.

USACE Response (#1): Adopted

1. **Action Taken: The IEPR panel recommended adding** a description of the basis for the assumption that the project will receive $100 million per year during the construction period.

8. IEPR Comment – *Medium Significance.* The mitigation requirements for the alternatives and the recommended plan are not described in the GRR and it is not clear whether the cost estimates include the cost of implementing and monitoring mitigation measures.

The comment includes two recommendations for resolution which were all adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended providing more detailed descriptions of the mitigation measures, how they will be implemented, and uncertainties related to implementation.

USACE Response(#2) Adopted

Action Taken: The IEPR panel recommended adding a discussion of how the cost estimates for mitigation measures and monitoring were developed, and include a line item for mitigation measures and monitoring in the total project cost estimate, and discuss uncertainty.

9. IEPR Comment – *Medium Significance.* Baseline conditions for invasive plants in the project area, and an effects analysis for invasive plant spread as a result of project construction, have not been presented.

The comment includes two recommendations for resolution which were all adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended discussing existing conditions for invasive plants/noxious weeds in the project area. If recent field or other site-specific data to characterize invasive plant conditions in the project area are not available, then a summary of the expected or likely conditions there based on land cover types, levels of disturbance, and known invasive plant occurrences in nearby areas would be adequate.

USACE Response (#2): Adopted

Action Taken: The IEPR panel recommended adding a discussion of construction-related impacts in the effects analysis and considering whether mitigation to prevent invasive plant spread during construction is needed.

10. IEPR Comment – *Medium Significance.* Some biological resources in the study area potentially affected by project implementation have not been presented in sufficient detail to describe the existing conditions and support the EIS/EIR analysis.

The comment includes two recommendations for resolution which were both adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended preparing and adding Figures 3.6-1, 3.6-2, 3.6-3, 3.6-4, and 3.6-5 to the Draft EIS/EIR. These figures were added to the EIS

USACE Response (#2): Adopted

Action Taken: The IEPR panel recommended adding a table that quantifies (in acres) and compare the amount of each land cover type, including waters of the U.S., assumed to be affected under each alternative.

11. IEPR Comment – *Medium Significance.* Issues that are important to the integrity of the levee that may affect its future performance (such as poor soil composition, presence of any large trees at or near the levee, and the likelihood of animals burrowing the soil) have not been fully addressed.

The comment includes two recommendations for resolution which were adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended implementation of an active abatement or control program to remove any animals or large trees that are located at or near the levees.

USACE Response (#2): Adopted

2. **Action Taken:** The IEPR panel recommended adding a discussion of construction-related impacts in the effects analysis and considering whether mitigation to prevent invasive plant spread during construction is needed.

12. IEPR Comment – *Medium/Low Significance.* A strategy has not been presented for allocating costs and benefits for West Sacramento alternatives that might be integrated with the Locally Preferred Option being considered in the American River Common Features Project.

The comment includes three recommendations for resolution; two were not adopted and one was adopted as discussed below.

USACE Response (#1): Not Adopted

Action Taken: The IEPR panel recommended development and application of a strategy for allocating costs and benefits to the American River Common Features Locally Preferred Option and the West Sacramento Project alternatives, assuming both projects are authorized.

USACE did not adopt this recommendation because neither the costs nor the benefits of the West Sacramento GRR and the American River Common Features GRR are shared. There are not any features of the two projects that have shared costs. Each project is a stand-alone project.

West Sacramento GRR Alternatives 2 and 4, which included the Sacramento Bypass widening, were not carried into the final array of alternatives, because they were not as cost effective as other alternatives. The District determined that because there is a limited amount of levee raising (approximately 5,000 ft. of levee) needed along the Sacramento River for the West Sacramento project, the more efficient option was to raise the levees in place to address that concern.

USACE Response (#2): Not Adopted

Action Taken: The IEPR panel recommended and assessment and documentation the non-Federal sponsors' willingness to participate in plans that integrate the American River Common Features Locally Preferred Alternative with the West Sacramento recommended plan.

Reason to not adopt – see above.

USACE Response (#3): Adopted

Action Taken: The IEPR panel recommended development of strategies for the West Sacramento Project based on future scenarios with and without authorization and construction of the American River Common Features Project.

13. IEPR Comment – *Medium/Low Significance.* It is not clear how evaluation metrics were used in screening preliminary alternatives or evaluating the final alternatives.

The comment includes one recommendation for resolution which was adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended a description of how the evaluation metrics in Table 3-18 were applied to the alternatives and how the alternatives compared. A table could be added to compare how well each alternative met the planning objectives based on the evaluation matrix.

14. IEPR Comment – *Medium/Low Significance.* It is not clear how the magnitude of impacts and level of significance were determined for effects of sedimentation and turbidity on fisheries resources.

The comment includes two recommendations recommendation for resolution which were adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended a description of how the evaluation metrics in Table 3-18 were applied to the alternatives and how the alternatives compared. A table could be added to compare how well each alternative met the planning objectives based on the evaluation matrix.

A table was added as suggested.

15. IEPR Comment – *Medium/Low Significance.* Details about dates, locations, and objectives of reconnaissance-level surveys for some biological resources are not presented.

The comment includes one recommendation for resolution which was adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel recommended a discussion of the survey methods, including survey areas, dates, and types of information collected in Sections 3.6, 3.7, and 3.8 of the Draft EIS/EIR. A discussion was added to the EIS as suggested.

16. IEPR Comment – *Low Significance.* No analyses have been reported that confirm that the seepage model extent is sufficient so that boundary effects do not result in inaccurate results.

The comment included one recommendation for resolution which was adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel requested that the inferred assumption should be confirmed in future design phases either by analyzing a few cases with larger model extents and comparing results to confirm that exit gradients are the same, or by applying constant head boundary conditions on vertical surfaces with reasonably assumed piezometric levels.

17. IEPR Comment – *Low Significance.* The use of effective peak shear strength parameters may not be appropriate for all materials.

The comment included one recommendation for resolution which was adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: The IEPR panel requested that during future design phases, evaluate whether conditions exist where using undrained or fully softened strength parameters might affect details of recommended repairs. If necessary, perform lab tests or use applicable correlations to determine appropriate strength parameters for use in detailed design.

18. IEPR Comment – *Low Significance.* The level of significance of impacts on biological resources after mitigation is not clearly presented.

The comment included 4 recommendations for resolution which were adopted as discussed below.

USACE Response (#1): Adopted

Action Taken: For the biological resources impact discussions presented in Sections 3.6, 3.7, and 3.8 of the Draft EIS/EIR (pp. 114-124, 131-135, 168-185), include a conclusion about whether all potentially significant effects have been reduced to a less-than-significant level, and which (if any) have not. (For consistency, this revision could be made to all of the resource sections.)

USACE Response (#2): Adopted

Action Taken: The IEPR panel requested the review of and, if needed, revision to Tables ES-1 and 4-2 to make them consistent with the analysis conclusions for biological resources.

USACE Response (#3): Adopted

Action Taken: The IEPR panel requested that details of the proposed mitigation for impacts on special-status bat species (e.g., survey methods, limited operating periods, minimization/avoidance measures, etc.) are provided.

USACE Response: (#4) Adopted

Action Taken: The IEPR panel requested that the cumulative effects discussion (pp. 384-387) be expanded to include a discussion of the projects contribution to a cumulative effect and its levee of significance. (For consistency, this revision could be made to all of the resource sections):

DEPARTMENT OF THE ARMY
SOUTH PACIFIC DIVISION, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94103-1398

REPLY TO
ATTENTION OF

CESPD-PDP (FRM-PCX) 5 February 2015

MEMORANDUM FOR Commander, Sacramento District, U.S. Army Corps of Engineers (CESPK-PM-C/Bryon Lake)

SUBJECT: Final Comment Response Record for the Independent External Peer Review (IEPR) of the West Sacramento Project, California, General Reevaluation Report (GRR) Flood Risk Management (FRM) Project

1. References:

a. EC 1165-2-214, Civil Works Review, 15 December 2012.

b. Memorandum, CESPD-PDP (FRM-PCX), 14 October 2014, subject: FRM-PCX Transmittal of Final Independent External Peer Review (IEPR) Report for West Sacramento Project, California, General Reevaluation Report (GRR) Flood Risk Management (FRM) Project.

2. Enclosed is the Final Comment Response Record for the Independent External Peer Review (IEPR) of the West Sacramento Project, California, General Reevaluation Report (GRR) Flood Risk Management (FRM) Project.

3. The Flood Risk Management Planning Center of Expertise (FRM-PCX) coordinated the IEPR, which was conducted by an external panel of experts selected and managed by the Battelle Memorial Institute. The IEPR panel comments were documented in the Final Independent External Peer Review (IEPR) Report for West Sacramento Project, California, General Reevaluation Report (GRR) Flood Risk Management (FRM) Project, dated 6 October 2014.

4. Eighteen IEPR final comments were developed by the panel, one of which was identified as having high significance. The Comment-Response Record documents the Sacramento District responses to the panel comments and the IEPR panel backcheck of the responses. Concurrence was reached between the panel and District on all 18 responses; however, the panel provided a clarifying statement as part of its concurrence with the District response to the final panel comment #3.

5. Based on the Comment-Response Record, the Sacramento District should prepare a written proposed response to the Final IEPR Report in accordance with reference 1.a. The proposed response should be coordinated with the Major Subordinate Command District Support Team and HQUSACE to ensure consistency with law, policy, project

guidance, ongoing policy and legal compliance review, and other USACE or National considerations.

6. For further information, please contact the undersigned at (415) 503-6852, or Ms. Anastasiya Kononova, PCX IEPR lead at (410) 962-2558.

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Encl

Eric Thaut
Deputy Director, Flood Risk Management
Planning Center of Expertise

CF:
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CESPK-PM-C (Bryon Lake)
CESPK-PPMD (Andrew Muha)
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